

Founded in 1832

# RAILWAY LOCOMOTIVES AND CARS

NOVEMBER 1957

A SIMMONS-BOARDMAN TIME-SAVER PUBLICATION

## 2 MINER

OUTSTANDING RECOMMENDATIONS  
FOR  
HIGH OPERATING EFFICIENCY

CLASS A-22-XL

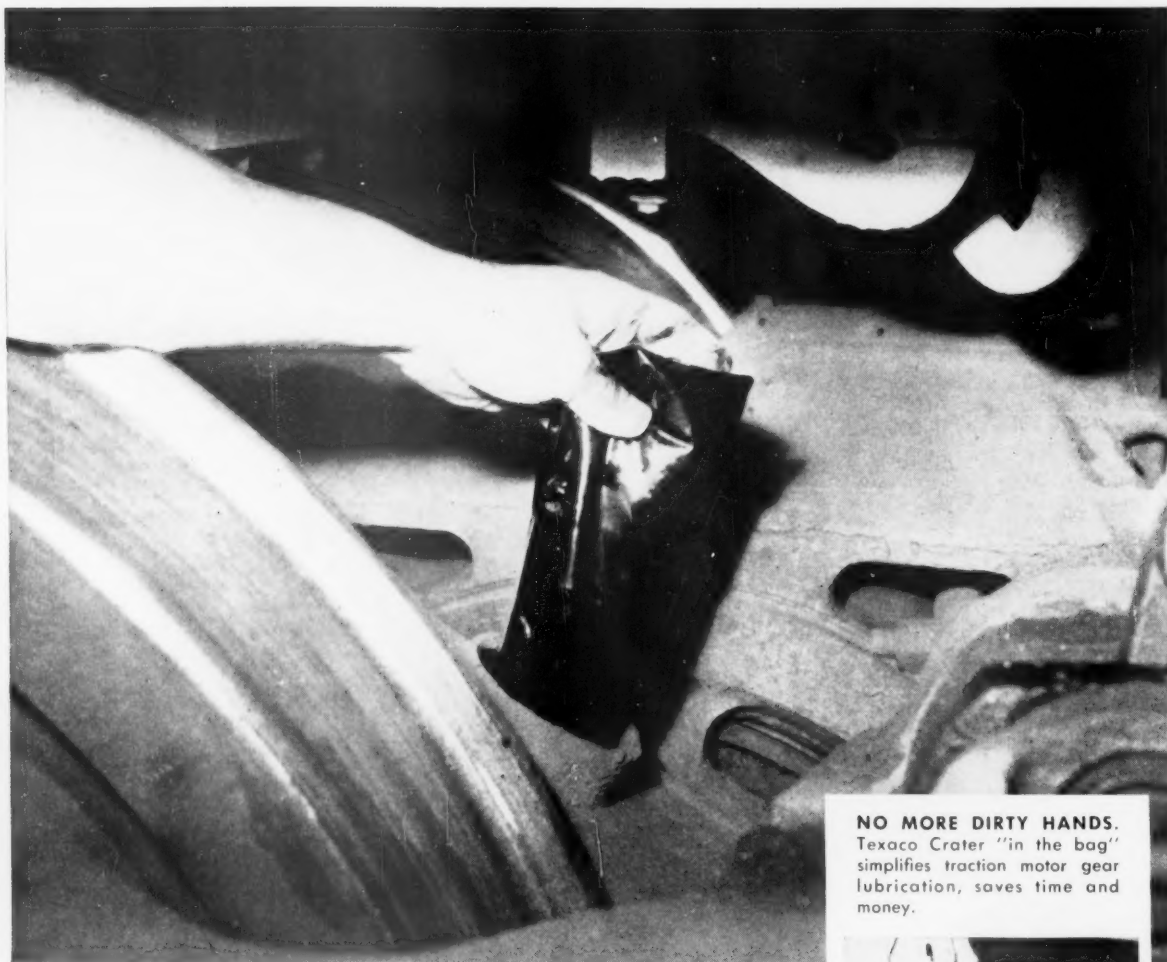


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The Miner Class A-22-XL Friction Draft Gear and Miner Class RF-333 Rubber-Friction Draft Gear fulfill every requirement for efficient performance in freight train operation and are approved for unlimited application to cars in interchange.

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**NO MORE DIRTY HANDS.**  
Texaco Crater "in the bag"  
simplifies traction motor gear  
lubrication, saves time and  
money.

## New Texaco Crater Package ... just drop in bag and all

Texaco Crater now comes in new polyethylene bags that reduce traction motor gear lubrication to one, simple motion. You just drop in bag and all.

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**RAILROAD LUBRICANTS AND SYSTEMATIC ENGINEERING SERVICE**



**1,650 cars**  
**21,700 months**  
**of service without a hot box!\***

\*That's the record rolled up using R-S journal stops and roll-type waste packing on 1,650 Frisco freight cars! On home rails, they've gone 21,700 months without a single hot box—proof that, properly contained, A.A.R. Approved Journal Box Packing will give long, economical, trouble-free service.

And look at the savings. As an example:

2,000,000 Freight cars packed with substitutes such as pads, etc., not yet proved *in service*, @ an average price of about \$50.00 per car set

**\$100,000,000.**

2,000,000 Freight cars packed with approved A.A.R. Journal Box Packing @ approximately \$4.90 per car set

**\$ 9,800,000.**

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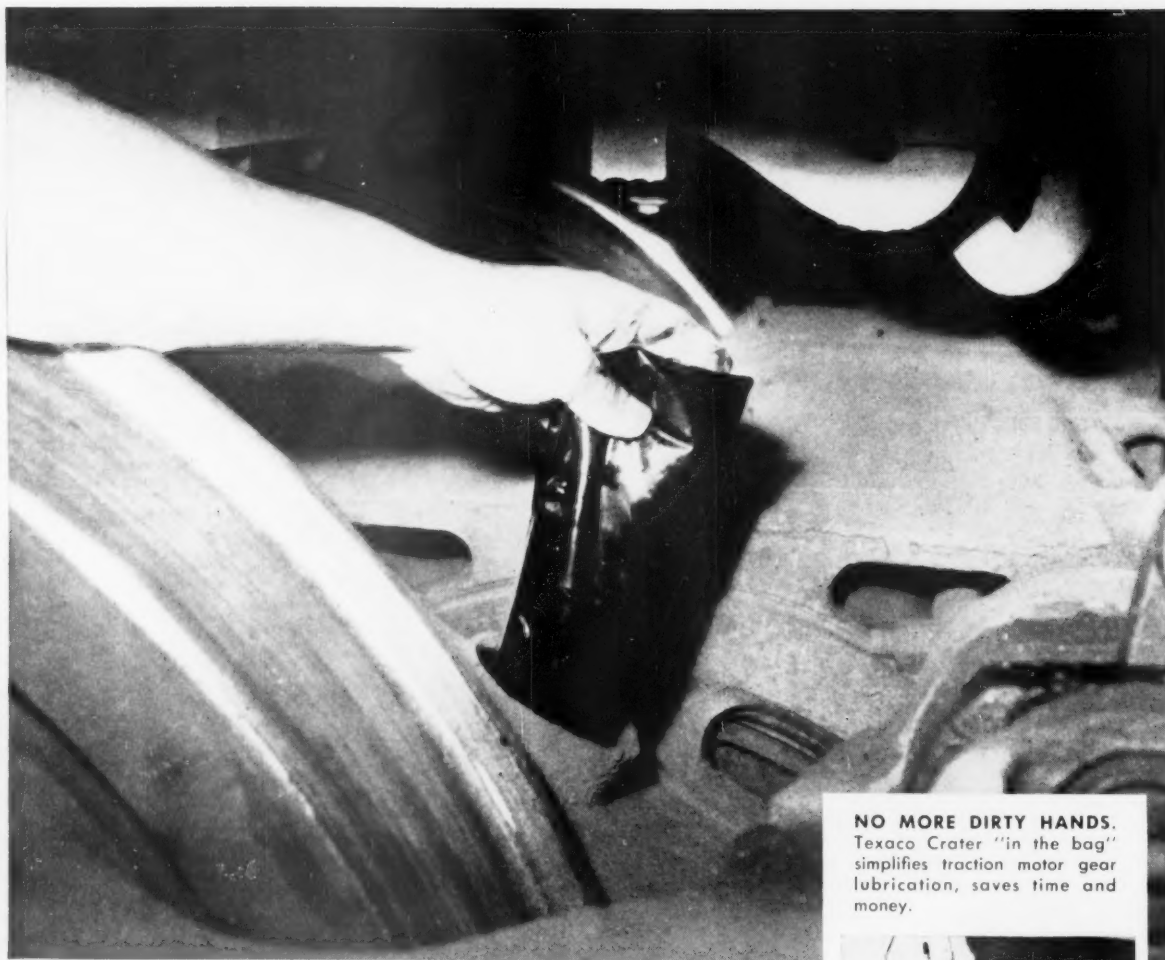
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**1,650 cars**  
**21,700 months**  
**of service without a hot box!\***

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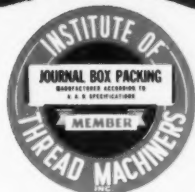
It all adds up to real economy when you stick to tried-and-true measures. In short, there is no economical replacement for A.A.R. Approved Journal Box Packing.

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## Baldwin wheel press assembles wheel sets in as little as 2 minutes

Baldwin and Niles railroad tools are cutting shop costs drastically in the nation's leading railroads. The wheel press pictured above, recently installed in Seaboard Air Line's new shop at Hamlet, N.C., can assemble wheel sets in as little as 2 minutes. Axles and wheels are supplied by gravity racks to the press, which can be fed by one man. One assembly man and a press operator are all the manpower required to process the sets.

The Baldwin wheel press also eliminates substantial installation costs. Due to the fact that the

carriage has its own built-in elevator, the machine can be accommodated by a pit only 6 in. below the floor line—in contrast with pits 6 or more ft. deep required for conventional equipment. Other efficient B-L-H railroad machine tools in operation at Seaboard's Hamlet shop include a new Niles wheel borer with sidehead, a Niles wheel lathe, and a specially designed Niles axle turning and burnishing lathe.

Write today for detailed information on B-L-H railroad machine tools.

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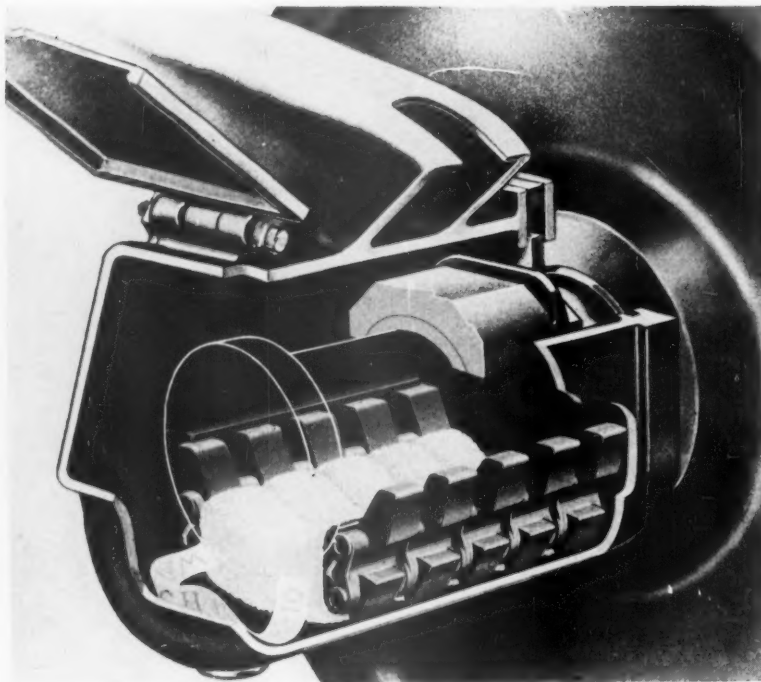
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# LOCOMOTIVES AND CARS WHAT'S NEW IN EQUIPMENT

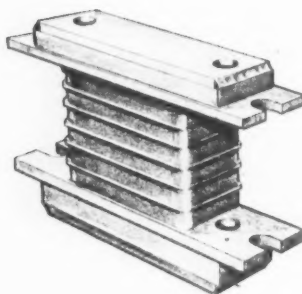


## Separable Journal Lubricator

Waughpak, a separable journal lubricator comprised of a fabric jacket and molded rubber fillers, has been approved by the AAR. Five arched molded rubber fillers inserted in loops in the fabric jacket serve to hold the lubricating pad firmly against the face of the journal while the loops, themselves, provide a series of wicks across the entire face

for rapid and constant lubrication.

Features claimed for this lubricator are positive wicking; freedom from glazing; cool operation; oil saving; ease of application and removal; and uncomplicated cleaning. There are no metal parts which could score the journal. *Waugh Equipment Company, Dept. RLC, 420 Lexington ave., New York 17.*



## Traction-Motor Nose Mounting

A traction-motor nose support mounting for use on standard railroad traction motors, has been developed, which resists high shock loads. The mounting

consists of specially compounded environmental resistant elastomer bonded to steel plates. The one-piece construction eliminates assembly and replacement of parts.

The mounting will not bottom-out under high shock loads, providing greater protection to the motor and motor housing. Pre-loading holds the mountings snugly in place.

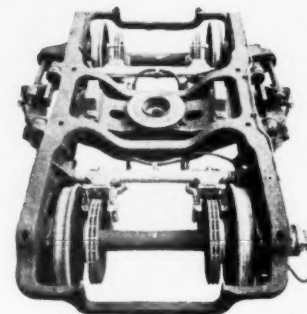
This new bonded rubber mounting is interchangeable with present suspension systems. *Lord Manufacturing Company, Dept. RLC, 1635 West 12th st., Erie, Pa.*

## Powdered Descaler

Drycid, an inhibited acidic descaler and deruster in powder form, is dry until it is to be used. Then water is added. Once

in solution, the material dissolves rust and water scale the same as any liquid acid would. It ships and stores like any powder. It doesn't have to be shipped in carboys, which require special handling and must be returned when empty, and no deposit is required for container.

In solution the material gives off only a mild aromatic odor. Its inhibitors protect metal during descaling and derusting. During limited exposure, the descaler has no injurious effect on steel and copper, and can be used with greater safety on aluminum, brass and galvanized surfaces. With Drycid, systems containing dissimilar metals can be descaled with a greater measure of safety than has been possible in the past, according to the manufacturer. Drycid has application wherever water scale, iron sulphide, rust or other metal oxides must be removed. When ready to use, it is added to water and stirred. The usual proportion is 8 oz per gal of water. For best results solution is heated 140 to 160 deg F. *Oakite Products, Inc., Dept. RLC, 19 Rector st., New York 6.*



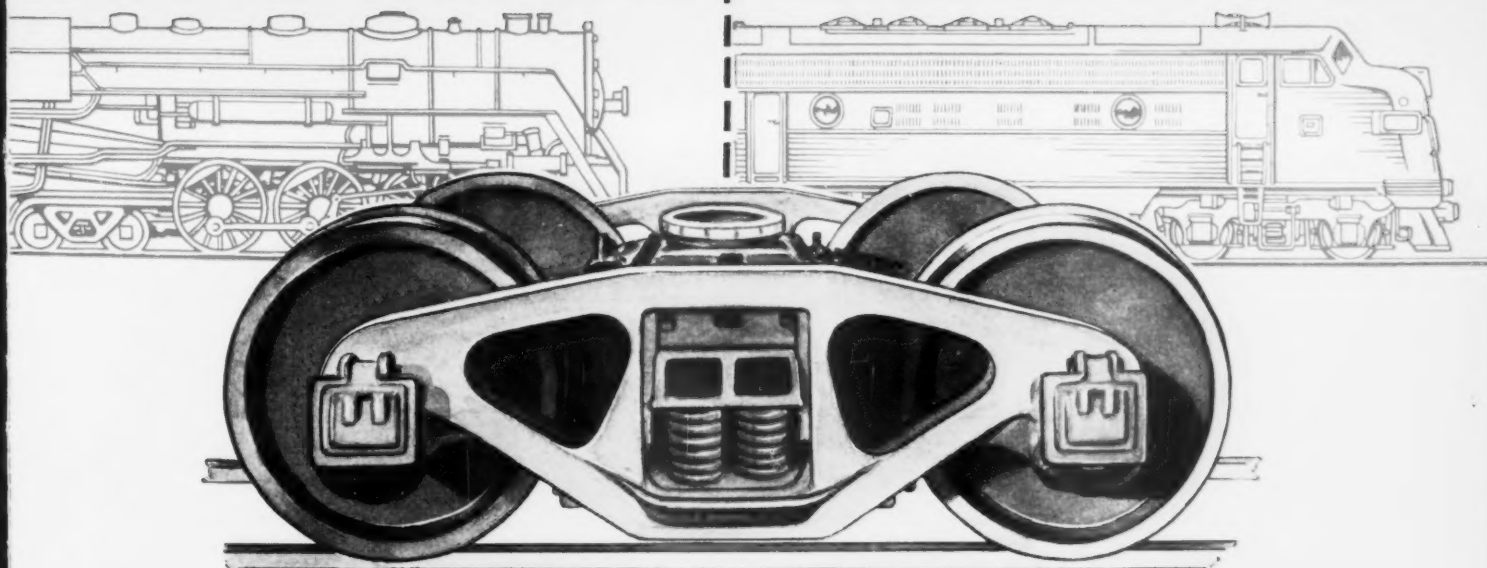
## Disc Brake

The TFM (truck frame mounted) brake is a passenger-car disc brake applicable to passenger-car trucks now in operation. It was designed to accommodate a variety of wheel bases, journal centers, and frame arrangements. While the Model TFM varies from the Model CF in certain components because the brake frame is mounted directly to the truck frame, it retains the fundamental features of the Budd Model CF. For new construction the brake can be mounted by providing the necessary support lugs or bosses as an integral part of the truck-frame casting and for brake conversion by providing an intermediate support to be rigidly attached to the truck frame.

The majority of the components used on the Model TFM, such as pins, bushings, tongs, shoes and cylinders, are identical to and interchangeable with

(Continued on page 10)





# The Old and the New...

## ...from waste to

## *A Great Step Forward!*

With waste gradually being discontinued in journal lubrication, the change-over to a better type of lubricator raises certain questions: what type should it be; what qualities should it possess; what kind of a performance should be expected of it? To help you decide, consider what the JBS Acme Lubricator offers and compare it with any other lubricator. JBS Acme alone has the exclusive all-wool quilted core\* which retains many times its own weight in oil reserve. Heavy chenille loop pile surfaces assure an ample supply of filtered oil at all times. JBS Acme Lubricators are unaffected by temperature changes and wick AAR specification car oil even at 45° below zero in road service tests. JBS Acme Lubricators require no modification of the standard journal box, are designed to hold their position in the box, and assure better performance with less servicing.

*Write Today for Detailed  
Information and Folder*

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\*Patent applied for

# JBS ACME JOURNAL LUBRICATORS



- ★ Retains oil up to 4 times its own weight
- ★ Requires no modification of journal box
- ★ Wicks AAR specification car oil even in coldest weather
- ★ Assures better performance with less servicing
- ★ Has exclusive all-wool quilted core\*
- ★ Reinforced for extra wear
- ★ Cannot glaze
- ★ Readily reclaimed

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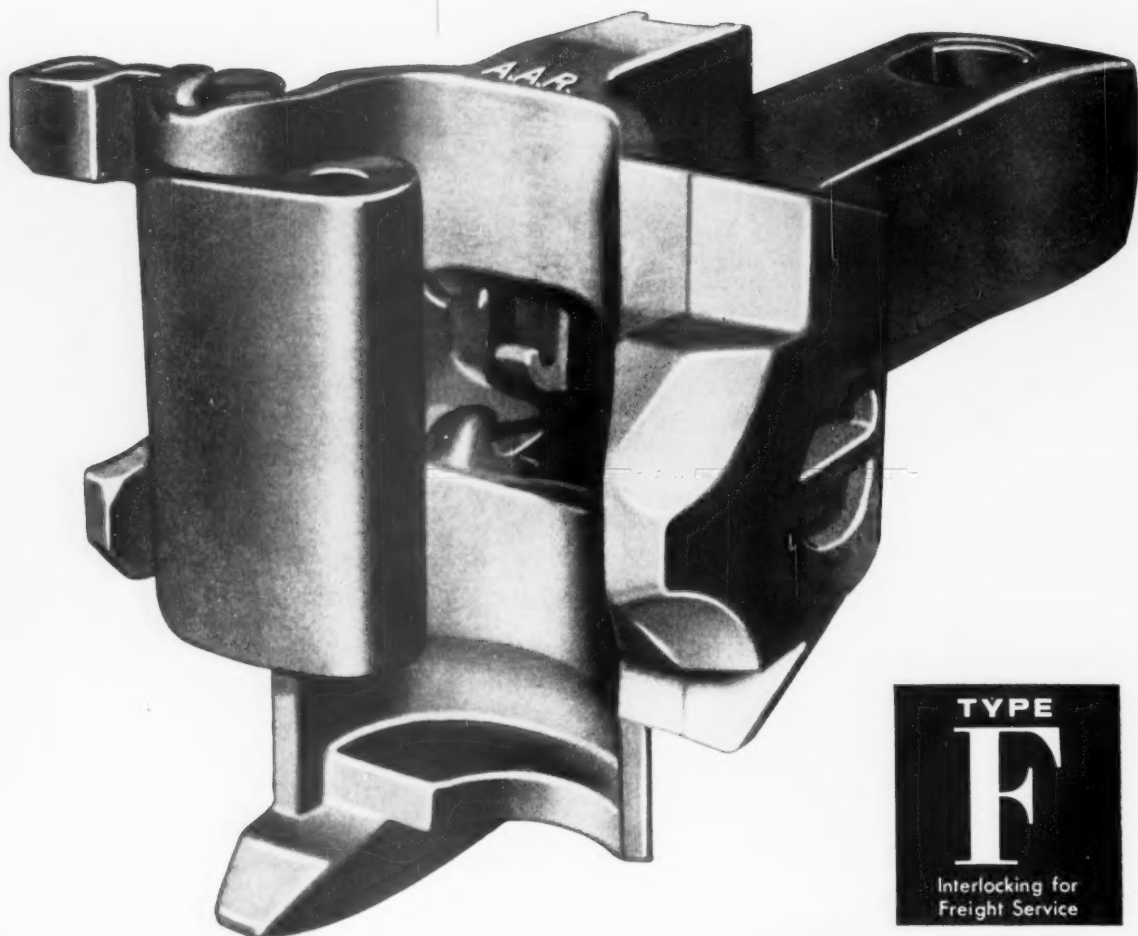
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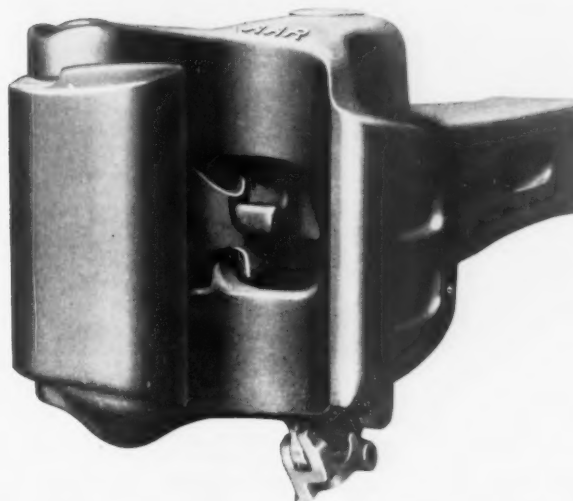
*There's Improved Railroading with*  
*National Specialties*

*Example:*

NATIONAL



**TYPE**  
**E**  
Standard for  
Freight Service



# COUPLERS



The development of the automatic railroad coupler parallels the experience of National as a coupler manufacturer. And today, as always, National couplers meet all AAR specifications for gauging and inspection. Close quality control, unmatched testing facilities, nationwide and international service—spell National coupler leadership. Always look for the name National—the name that *means* couplers.

A.A. 528K

**NATIONAL MALLEABLE and STEEL CASTINGS COMPANY**

*Railway Division Headquarters  
Cleveland 6, Ohio*

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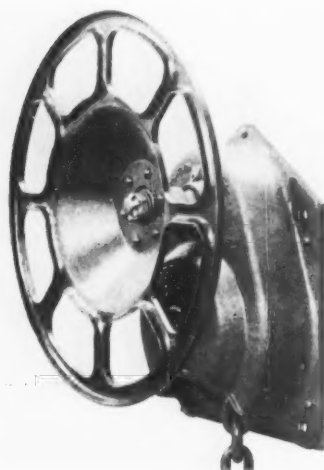
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**Established 1868**



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(Continued from page 6)  
those used on the Model CF brake. One of the fundamental features of the Budd disc brake is the provision of vertical alignment of the brake shoes with the braking surfaces of the disc to assure uniform brake pressure. This is incorporated in the TFM brake. *Railway division, Budd Company, Dept. RLC, Philadelphia 15.*



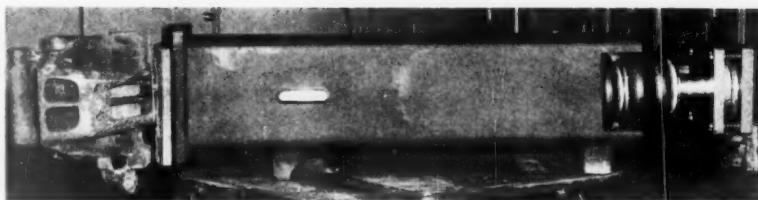
## Hand-Brake Wheel

This pressed-steel brake wheel is AAR certified and is now standard on the Equipco non-spin, vertical wheel hand brake. It is available for replacements and is designed to eliminate warpage—to stay true-turning without wobble. Added strength and rigidity resist strain and impact, but damaged wheels can be straightened without weakening the metal structure.

Other advantages claimed are its rim size for most convenient gripping; smooth coined edges that can't snag hands or clothing, and a rugged, forged-steel hub securely riveted to center section. *Equipco Hand Brake Division, Union Asbestos & Rubber Co., 2900 West Vermont st., Blue Island, Ill.*

## Hot-Box Extinguisher

The dry chemical Blazer fire extinguisher for hot boxes is a 1-lb moisture-proof container with a perforated metal top which permits rapid flow of dry chemicals after a plastic seal has been removed. The addition of the shaker-type container supplements the pump gun and 4-oz packet previously supplied. *Warren Chemical Manufacturing, Inc., Dept. RLC, 600 Pleasant st., Norwood, Mass.*



## Hydraulic Draft Gear

The Welex hydraulic draft gear is designed to obtain cushioning and control at all stages of impact without recoil. The gear is completely free of air and is hermetically sealed. All operating pressures are confined to a cylinder that is incased in a housing with the cylinder and piston unit completely surrounded by the low-pressure hydraulic fluid. The draft gear is designed to use a standard Type E coupler with 24 3/4-in. shank. Attached to the coupler is a radius collar that mates with the radius of the striker on the end of the unit housing. All forces in buff are taken at this point. On pull-out, the coupler shank pulls against the key. There is a minimum of clearance (about 1/4 in.) between the key and the end of the slot in the shank of the coupler, which is just sufficient to permit a free swivel of the coupler. The coupler and shank are removed by taking out one standard key, with the hydraulic unit remaining in the car center sill.

Since this unit is effective both on pull-out and impact and because it does not have any period of uncontrolled slack, a much longer cushion stroke can be used. An 8-in. stroke has been constructed into the unit. The restoring of the unit is limited to 1 in. before

reaching the pull-out limit on the key in the end of the slot of the center sill. This provides a 7 in. cushion in buff when a car is struck while at rest, but still provides a full 8 in. cushion in the run-in or run-out. Any movement of the coupler and shank is under positive control of the fluid in the hydraulic unit. Flow of the fluid on an impact stroke is independent of the flow on the pull-out, permitting the control of pressure or the establishment of any desirable resistance on one stroke without affecting the other. The restoring springs and auxiliary limit springs are not of sufficient tension to have any noticeable effect on the cushioning of the unit. The springs restore the unit to normal position only.

This hydraulic draft gear is adaptable to existing cars as well as new cars. To adapt the unit to existing cars, it is necessary only to clear out the center sill from the bolster filler to the end, remove the present striker plate, install the striker assembly adaptable to the unit, install the back stop and means for securing the unit to the center sill just forward of the bolster center filler and install the spring arrangement that restores the unit to the normal position. *Welex Jet Services, Inc., Dept. RLC, P. O. Box 11336, Fort Worth, Tex.*



## Bridge for Piggyback Cars

A rolling type bridge for spanning the opening between cars in piggyback service has a pair of small flanged wheels at rear of bridge running on a track built into the car structure. A second pair of wheels is mounted on a curved cantilever spring at end of car. According to the manufacturer, little effort is required to move the bridge across the opening between the cars.

In running position, the bridge is re-

tracted and lays horizontally on the car to which it is attached, parallel with car deck, and is held in position by a safety latch. This device is said to eliminate safety hazards, inconvenience, and time consumed in use of heavy, hinged type bridge plates which must be locked upright in position for movement over the road. *Brandon Equipment Co., Dept. RLC, 332 South Michigan ave., Chicago 4.*

## Insulation Binder

Transulite is a glass-fiber insulation bonded with a thermosetting resin designed to meet the severe moisture problems of the refrigerated transportation industry. The binder, the company says, insures that the total moisture resistance will meet or exceed the indus-

(Continued on page 76)



# DAVIS

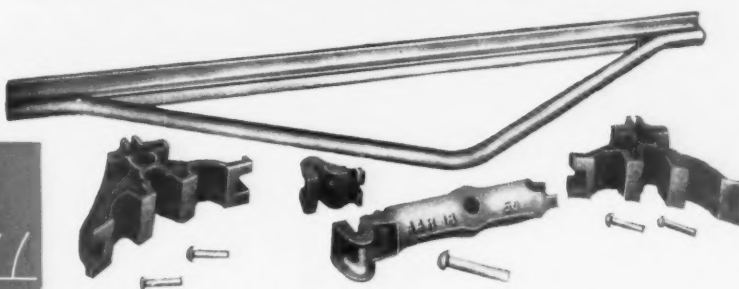


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No. 18  
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## SOLID TRUSS BRAKE BEAMS

**A RECOGNIZED  
STANDARD FOR  
MORE THAN 30 YEARS**

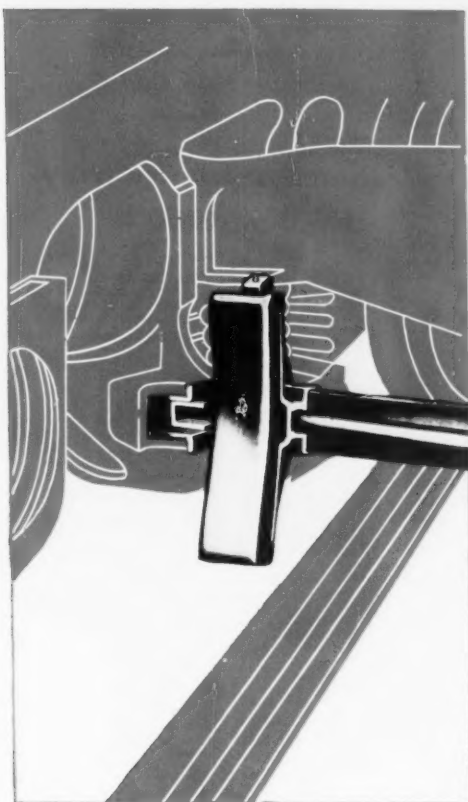
Whether for Conventional Hanging  
or for UNIT TRUCKS Davis Solid  
Truss Brake Beams are DECISIVELY  
SUPERIOR.



**ANY PART RENEWABLE  
Without Disturbing the Truss!**

### OTHER IMPORTANT FEATURES:

- One piece FORGED truss
- No Threaded Rods
- Interchangeable Right and Left Brake Heads Are Easily Applied without Dismantling Truss



# DAVIS

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Boston • Chicago • Cleveland  
Richmond • St. Louis • San Francisco

# LOCOMOTIVES AND CARS REPORT

## Orders and Inquiries for New Equipment Placed Since the Closing of the October Issue

### Diesel-Electric Locomotive Orders

Road and builder	No. of units	Horse-power	Service	Other detail
CANADIAN PACIFIC:				
General Motors Diesel	31	1,200	Road switchers	—
	23	1,750	Road switchers	—
Montreal Locomotive Works	52	1,800	Road switchers	—
	11	660	Yard switchers	—

### Freight-Car Orders

Road and builder	No. of cars	Type of car	Cap-tons	Other detail
CHICAGO & EASTERN ILLINOIS:				
Company shops	10	Depressed center flat	125	Cost, \$35,000 each.
DENVER & RIO GRANDE WESTERN:				
American Car & Fdry	300	Hopper	70	—
MISSOURI PACIFIC:				
General American	50	Covered hopper	70	Delivery expected fourth quarter 1958.
PACIFIC FRUIT EXPRESS:				
Company shops	500	Mech. refrigerator	—	50-ft. "super giants" for frozen foods
	500	Mech. refrigerator	—	40-ft. for smaller frozen food shipments and for fresh fruit and vegetables. 1,000 cars to be delivered between March 1958 and February 1959.
UNION TANK CAR CO.:				
Company shops	225	Tank	—	For late 1957 or early 1958 delivery.

### Inquiries and Notes

#### LOCOMOTIVES:

**Pennsylvania**—The Pennsylvania may obtain part or all of a proposed diesel locomotive order through a lease arrangement with the builder. Bids have been asked on 200 locomotives—165 road switchers and 35 yard switchers. Both on a purchase-for-cash and 15-year lease basis. The railroad's action comes in the wake of persistent reports that a leasing arrangement might enter the locomotive financing picture; and it follows a call for quotations by PRR earlier this year on a similar program. In its current call, the Pennsylvania specified that leasing be set up on an initial term of 15 years, with option to the lessee to extend leases of any or all of the engines for 1-year terms, up to a 10-year maximum. Quotations were asked on annual or semi-annual rental over the initial 15-year term and on a daily rental during any extension of the original leases. In addition, Pennsy sought a basis from bidders, as an adjustment of its rent, as to what the bidder will be willing to pay the railroad after return of the locomotives at the end of the lease, amounts which may be reserved by the bidder with regard to sale, lease, use or other disposition of the equipment. Separate quotations were asked for each type of locomotive. The Pennsylvania's call for bids contemplates acquisition of 85 4-motor road switchers, 50 6-motor road switchers, 30 B-unit 4-motor road switchers and 35 yard switchers. Road switchers will be of 1,600- to 1,800-hp; yard engines will be in the 1,000- to 1,200-hp range.

#### FREIGHT-TRAIN CARS:

**Missouri Pacific**—Directors authorized expenditure of \$13,605,250 for 1958 freight-car program, including (from company carbuilding plant at DeSoto, Mo.) 300 50½-ft DF box, 600 40½-ft 50-ton box, 100 65-ft mill type gondola, 500 52½-ft 70-ton solid-end gondola and 100 52½-ft 70-ton drop end gondola cars; and, from General American, 50 70-ton "Airslide" gondola cars.

#### PASSENGER EQUIPMENT:

**Great Northern**—Ordered 15 additional sets of Budd Company disc brakes for installation on 175 cars in "Empire Builder" fleet. GN officials reported to have placed order following studies which showed use of disc brakes would appreciably reduce maintenance costs.

## ASME Railroad Division Meets December 4-5

The following program has been prepared for the ASME Railroad Division in conjunction with the annual meeting of the American Society of Mechanical Engineers to be held in New York December 1-6.

HOTEL STATLER  
Wednesday, December 4

10 am  
Committee meeting.

2:30 pm  
Report: Progress in Railroad Mech-

anical Engineering. Report of Committee RR 6 presented by D. R. Meier, manager railway locomotive engineering, General Electric Co.

Notes on the Starting of Trains, S. Kyropoulos, Holloman Air Development Center.

Advancing Adhesion—Development and Test of a Chemical Formulation to Condition the Running Surface of the Rail for Improved Wheel to Rail Adhesion, F. G. Fisher, mechanical engineer, Reading; R. K. Allen, Locomotive and Car Equipment Department, General Electric Co.; G. W. Luvisi, manager,

products development, National Aluminate Corp.

Improving Rail Adhesion for Diesel Locomotives, P. V. Garin, engineer research and mechanical standards, Southern Pacific.

6 pm  
Railroad Division Reception.

Thursday, December 5  
9:30 am

Mechanical Refrigeration in Railroad Refrigerator Cars, B. E. Duff, superintendent, mechanical refrigeration, Fruit Growers Express Co.

Testing of Railway Passenger Cars and Components, W. W. Seary, chief engineer, Testing Division, Budd Co.

Some Factors Affecting the Riding Comfort of Passenger Cars, W. E. Burdick, engineer of tests, General Steel Castings Corp.

12 Noon

Railroad Division Luncheon. Speaker: Owen Clarke, chairman, Interstate Commerce Commission.

2:30 pm

Should Purchasing Be a Matter of Material and Construction Specification or Functional Specification, J. D. Loftis, marketing director, Products Project.

(Continued on page 18)

## Summary of Monthly Hot Box Reports

Month	Cars set off between terminals with Hot Boxes		Miles per car set off
	System	Foreign	
July 1953	9,342	15,775	116,467
July 1954	7,956	10,912	141,946
1955			
July	8,086	13,635	133,813
August	8,555	14,358	128,941
September	5,896	10,469	178,649
October	3,966	7,182	271,364
November	2,010	3,972	493,184
December	1,819	3,774	522,444
1956			
January	2,029	4,302	462,029
February	2,570	5,611	341,542
March	2,517	6,212	346,853
April	3,202	6,881	290,626
May	4,672	10,903	196,688
June	6,777	15,125	135,774
July	8,484	16,067	113,573
August	8,991	16,892	113,474
September	6,834	12,629	149,970
October	4,357	8,429	243,505
November	2,650	5,560	359,759
December	2,256	4,436	438,425
1957			
January	3,373	6,121	291,453
February	3,272	6,844	264,538
March	3,164	6,687	307,306
April	3,949	8,447	228,493
May	6,580	12,691	154,387
June	8,285	16,277	115,749
July	10,438	18,819	96,064

# MOTOR WHEEL ANNOUNCES

## Improved Longer Service **PRESSED STEEL** Journal Box Lids

### NEW

### "CONSTANT PRESSURE" COMPRESSION SPRING

- HAS GREATER RANGE OF DEFLECTION
- PROVIDES GREATER SURFACE CONTACT
- INCREASES LID LIFE

Motor Wheel's improved coil spring center construction provides constant pressure over a greater seating surface on the housing. Service tests have proven that this improved assembly increases lid life.

Motor Wheel lids provide 4-way articulation . . . extended housing arms to facilitate raising lid . . . 120° opening for service . . . installation or removal without tools . . . and rugged, pressed steel construction.



Certified by A.A.R. to latest Spec. M-120-47

**MOTOR WHEEL  
CORPORATION**

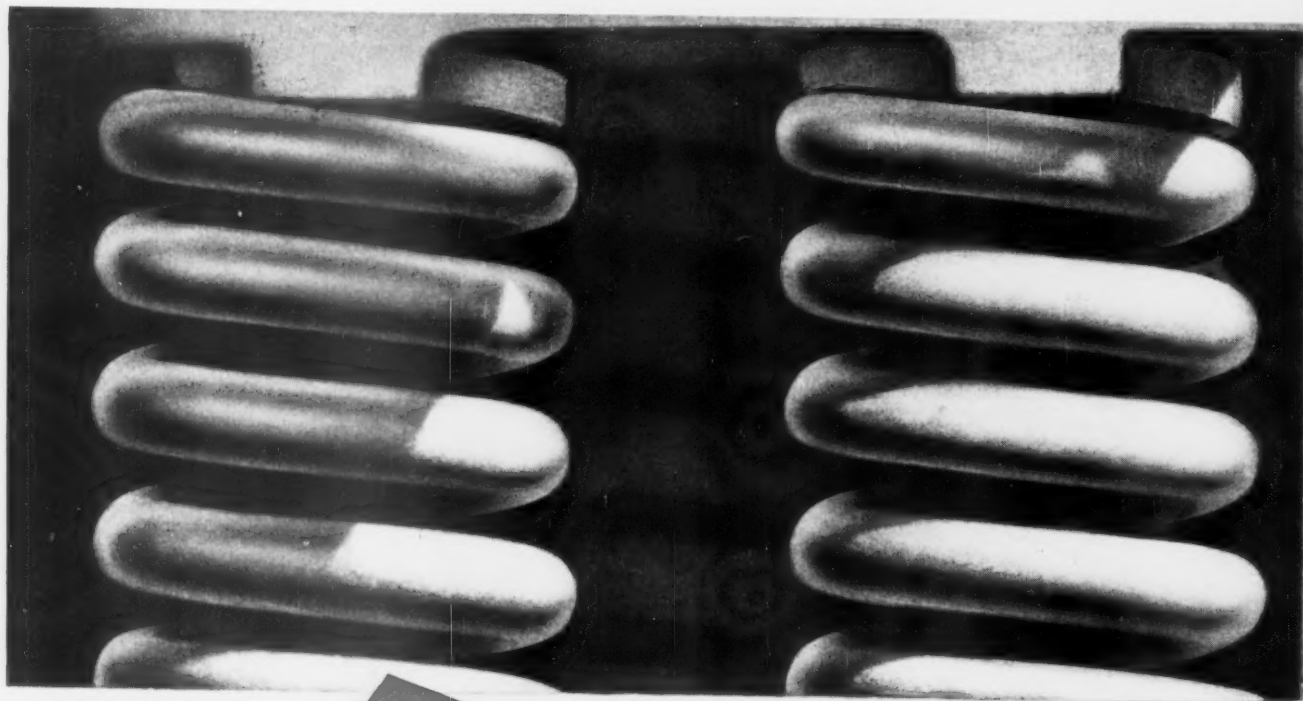
LANSING 3, MICHIGAN



National Railway Sales Representatives  
**T-Z RAILWAY EQUIPMENT CO.**  
G. S. TURNER, President  
8 South Michigan, Chicago 3, Ill.



*The spring that provides*  
**a soft ride.**

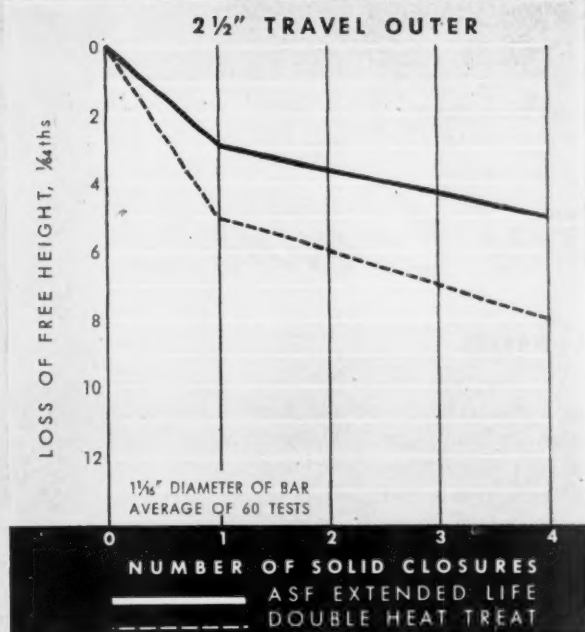


**A S F**





# ...longer!



Here is one of the really significant advantages of ASF Extended Life Springs. As shown by the graph, these springs have almost twice the resistance to permanent set—compared with conventionally heat-treated springs.

In many ways this is a more important advantage of Extended Life Springs than greater resistance to breakage. Any car man can quickly detect a broken spring . . . but the *unseen* cause of many a hard-riding car is the spring that is shirking its share of the load.

ASF Extended Life Springs are available at no increase in price. How much will they save on your road? It depends on your own operating conditions . . . but specifying these modern springs will give you an automatically higher return on your spring investment.

## E-X-T-E-N-D-E-D L-I-F-E SPRINGS

*A contribution to railroad progress through research by*

**AMERICAN STEEL FOUNDRIES**

Prudential Plaza, Chicago 1, Illinois

Canadian Sales: International Equipment Co., Ltd., Montreal 1, Quebec



*Rebuilding piston crowns by sigma welding in a matter of minutes saves approximately 70% of new piston cost.*

## *Rebuilding a Titan's Crown...*

### **By Sigma Welding**

Because it delivers increased horsepower faster and more efficiently than a steam boiler, the diesel engine has become a mighty and hard-working titan on the American right of way. But diesel economy and efficiency depend largely on maximum engine compression. Sigma welding is helping railroads maintain this vital compression efficiency by making it routine shop work to build up piston crowns and replace piston carriers—at savings up to 70 per cent of new part cost.

Sigma welding's combination of automatic wire feed

and argon gas shielding is simplifying and speeding a wide range of jobs in shops across the nation. The sigma process joins all commercially fabricated metals, and attains speeds of more than 100 inches per minute in many operations. Both manual and automatic mechanized installations are easy to operate and maintain.

Learn how railroads are making greater savings than ever before with LINDE's modern methods for joining metals. Call your local LINDE representative today.

RAILROAD DEPARTMENT

**LINDE COMPANY**

DIVISION OF



CORPORATION

30 East 42nd Street, New York 17, New York

In Canada: LINDE COMPANY, Division of Union Carbide Canada Limited, Toronto

"Linde," "Oxweld," and "Union Carbide" are registered trade-marks of Union Carbide Corporation.

The familiar symbol of over  
forty years' service  
to the railroad industry.



# YOU CAN'T TELL A FREIGHT CAR BY ITS COVER!

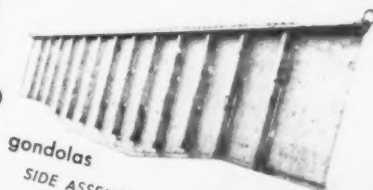
Look to the  
○ COMPONENT PARTS  
for its true value . . .  
because a freight car  
○ is no better than its  
weakest component!

## INDEX

1. unit load cars  
UNDERFRAMES, BULKHEADS, DOORS
2. box cars  
UNDERFRAMES, SIDE ASSEMBLIES,  
DOORS
3. bulkhead flatcars  
pulpwood cars  
piggy back cars  
UNDERFRAMES, BULKHEADS
4. gondolas  
UNDERFRAMES, SIDE ASSEMBLIES,  
FLOORS
5. hopper cars  
UNDERFRAMES, SIDE ASSEMBLIES,  
HOPPERS
6. refrigerator cars  
UNDERFRAMES, SIDE ASSEMBLIES,  
DOORS
7. cabooses  
UNDERFRAMES

### ○ INTERNATIONAL'S BULK-LADING SIDE DOOR

Requires no inside grain  
door . . . and has an access  
tion and sampling. Positive  
retainment on the car  
structure.



gondolas  
SIDE ASSEMBLIES

### INTERNATIONAL'S ALL-WELDED BOX-CAR SIDES

Delivered ready to assemble, to  
car owners who assemble their  
own cars. Maximum welded  
attachment to the side plate  
and side sill upper elements.



INTERNATIONAL'S CENTER FILLER,  
REAR DRAFT LUGS, CENTER PLATE,  
one steel casting welded integrally into the  
bolster-center sill connections . . . International's  
corrective design for an ALL-WELDED UNDER-  
FRAME which has a history of NO FAILURES!



HOPPERS

**INTERNATIONAL  
STEEL COMPANY**  
RAILWAY DIVISION

**PRECISION** FABRICATORS OF  
CORRECTIVELY DESIGNED COMPONENTS

EVANSVILLE 7, INDIANA



## Report

(Continued from page 12)

American Car & Foundry Division, ACF Industries, Inc.

Design of an 8,500-Hp. Gas-Turbine-Electric Locomotive for High-Speed Freight Service, F. D. Gowans, acting manager, Railway Locomotive Engineering, General Electric Co.

A Proposed Coal-Burning Gas-Turbine Locomotive, D. L. Mordell, dean of engineering, McGill University.

## Scored Journals Ruled Off the Rails

Scrapping scored and gouged axles damaged by overheated bearings will be mandatory for all freight cars soon. AAR car-owner members have voted for this requirement along with another making magnetic-particle and ultrasonic testing mandatory for overheated axles even though no surface damage is apparent. Expense will fall on the line handling the car when the hot box occurs.

## Miscellaneous Publications

**RECOMMENDED PRACTICE FOR REPAIR WELDING AND FABRICATION WELDING OF STEEL CASTINGS.**—1957 Manual replaces "Recommended Practice for the Welding of Steel Castings" first issued in 1951. Incorporates the many developments in welding procedure since that date and features comprehensive listing of American Welding Society Classified Mild Steel and Low-Alloy Electrodes. Covers in three sections welding methods, electrodes and recommended welding procedures for carbon-steel and low-alloy castings with each general alloy series indexed for quick reference. Manual a guide for those who use cast-weld technique or who fabricate larger structures using composite-fabrication by means of which steel castings are welded to wrought steel. Serves also as a guide for the repair or field modification of cast and wrought steels. *Steel Founders' Society of America*, 606 Terminal Tower Building, Cleveland 13. Cost, 50 cents.

**FLAMMABLE LIQUIDS CODE.** 1957 edition of Flammable Liquids Code, NFPA No. 30, supplants former Suggested Ordinance on Flammable Liquids and, in new form, is intended for use not only as a basis of municipal ordinances, but also as the basis of state or provincial regulations. Discusses protection of tanks containing flammable liquids in locations that may be flooded, and the abandonment or removal of underground tanks. *National Fire Protection Association*, 60 Batterymarch st., Boston 10. Price, 60 cents.

## Selected Motive Power and Car Performance Statistics

Freight Service (Data from I.C.C. M-211 and M-240)

Item No.	Month of July	7 months ended with July	
		1957	1956
3 Road locomotive miles (000) (M-211)			
3-06 Total, Diesel-electric	36,704	35,559	256,708
3-07 Total, electric	658	682	4,511
3-04 Total, locomotive-miles	39,338	39,336	278,137
4 Car miles (000,000) (M-211)			
4-03 Loaded, total	1,545	1,520	11,219
4-06 Empty, total	974	939	6,655
6 Gross ton-miles-cars, contents and cabooses (000,000) (M-211)			
6-03 Total in Diesel-electric locomotive trains	106,300	99,700	754,913
6-04 Total in electric locomotive trains	2,107	2,040	15,203
6-06 Total in all freight trains	115,127	110,375	822,317
10 Averages per train-mile (excluding light trains) (M-211)			
10-01 Locomotive-miles (principal and helper)	1.02	1.02	1.03
10-02 Loaded freight car-miles	42.0	41.2	42.7
10-03 Empty freight car-miles	26.4	25.5	24.0
10-04 Total freight car-miles (excluding caboose)	68.4	66.7	66.7
10-05 Gross ton-miles (excluding locomotive and tender)	3,125	2,995	3,156
10-06 Net ton-miles	1,401	1,310	1,400
12 Net ton-miles per loaded car-mile (M-211)	33.4	31.8	33.3
13 Car-mile ratio (M-211)			
13-03 Per cent loaded of total freight car-miles	61.3	61.8	62.8
14 Averages per train hour (M-211)			
14-01 Train miles	18.6	18.8	18.7
14-02 Gross ton-miles (excluding locomotive and tender)	57,486	55,693	58,808
14 Miles per diesel-electric unit day (M-240)	202.5	—	209.6
14-01 Road freight units	456.4	—	442.4
17 Car-miles per freight car day (M-240)	44.4	43.2	45.8
17-01 Serviceable freight cars	42.4	41.5	44.0
17-02 All freight cars	870	815	919
18 Average net ton-miles per freight car-day (M-240)	110.5	111.1	110.7
19 Per cent of home cars of total freight cars on the line (M-240)			

## Passenger Service (Data from I.C.C. M-213)

3 Road motive-power miles (000)			
3-06 Diesel-electric	20,343	20,895	136,783
3-07 Electric	1,134	1,226	8,189
3-04 Total	21,822	22,830	147,183
4 Passenger-train car-miles (000)			
4-08 Total in all locomotive-propelled trains	227,189	239,896	1,507,586
4-11 Total in Diesel-electric locomotive trains	211,189	219,447	1,392,082
12 Total car-miles per train-mile	9.90	10.07	9.74

## Yard Service (Data from I.C.C. M-215)

1 Freight yard switching locomotive-hours	3,769,494	3,371,655	26,454,604	26,470,927
1-03 Diesel-electric	3,915,612	3,567,094	27,604,614	28,363,431
1-06 Total				
2 Passenger yard switching hours				
2-03 Diesel-electric	241,087	248,626	1,690,105	1,733,869
2-06 Total	268,651	281,175	1,887,952	1,973,098
3 Hours per yard locomotive-day (averages)				
3-02 Diesel-electric	14.9	13.9	15.4	15.7
3-05 Serviceable	15.1	13.9	15.5	15.7
3-06 All locomotives (serviceable, unserviceable and stored)	14.0	12.7	14.3	14.2
4 Yard and train-switching locomotive-miles per 100 loaded freight car-miles	1.76	1.64	1.70	1.68
5 Yard and train-switching locomotive-miles per 100 passenger train car-miles (with locomotives)	0.73	0.72	0.77	0.75

Excludes B and trailing A units

## Personal Mention

**Boston & Maine.**—WALWORTH B. WILLIAMS, general foreman, Mechanicville diesel shop, appointed maintenance supervisor at Boston Engine Terminal. ROBERT W. NUTTALL, assistant general foreman at Mechanicville diesel terminal, appointed general foreman. JOHN O. BUYERS, night general foreman, appointed assistant general foreman. THOMAS AIREY, general foreman, Portland-Terminal Company, appointed general foreman at Concord, N. H., car shops. CARL MAGNUSON, general foreman at Concord Shops, appointed foreman at East Cambridge, Mass., car shops. ARMAND LEMIEUX, foreman of locomotive and car shops at Troy, N. Y., appointed general foreman of car department at

Mechanicville. KENNETH W. CHAMBERLAIN, assistant supervisor, air brakes and train conditioning, named air-brake instructor.

**Chesapeake & Ohio.**—A. B. RAY appointed general car foreman, Parsons, Ohio.

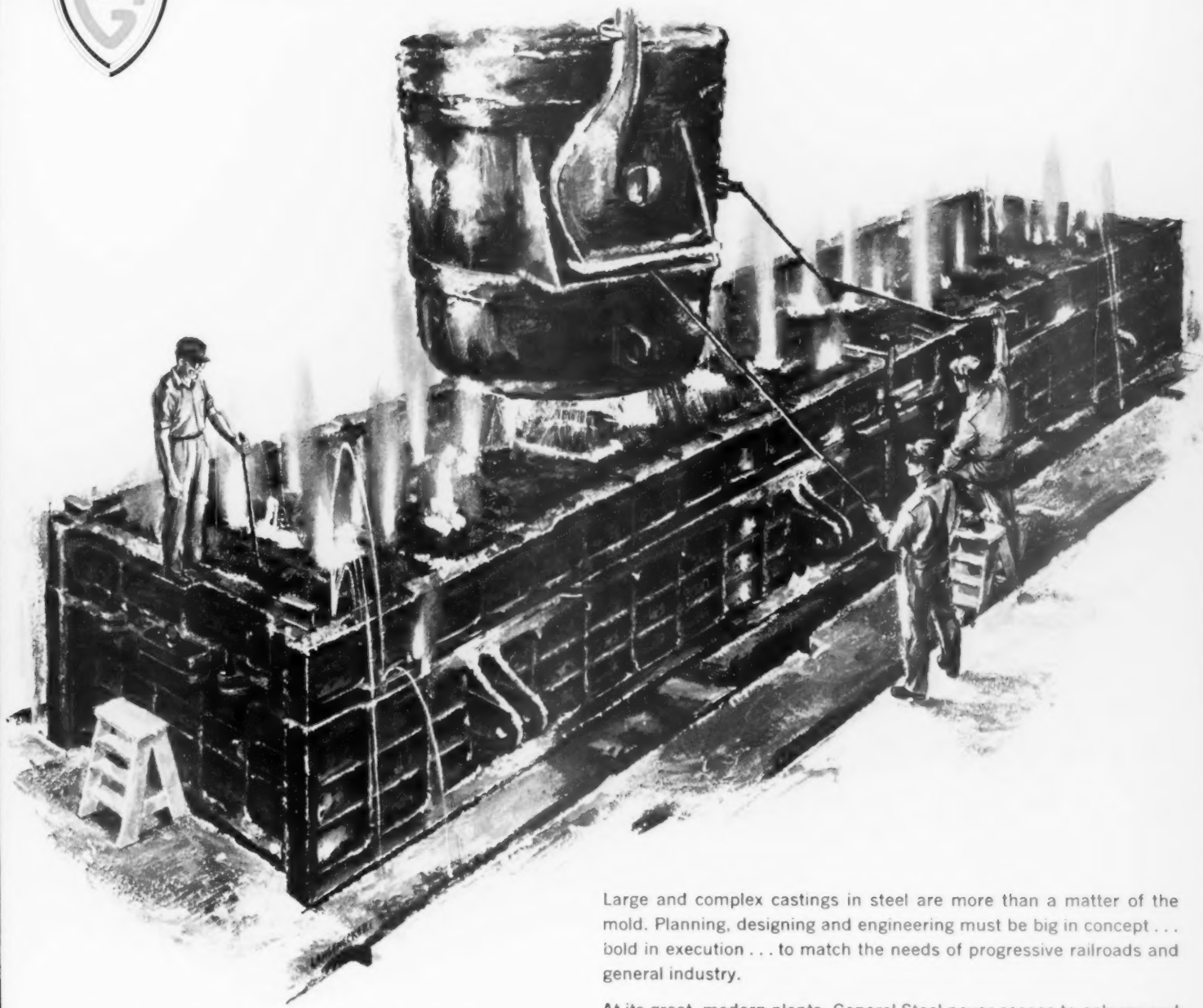
**Canadian Pacific.**—J. FOWLER, appointed division master mechanic, Portage Division. J. D. ROSS succeeds Mr. Fowler as general locomotive foreman at Winnipeg. J. F. BISHOP succeeds Mr. Ross as locomotive foreman at Kenora, Ont.; and F. S. C. TURNER, shop foreman at Brandon, Man., succeeds Mr. Bishop as locomotive foreman at Brendenbury, Sask.

(Continued on page 20)





Where railroad progress is cast in steel.....



*Molten steel cascades from ladle into massive mold to form a Commonwealth one-piece freight car underframe.*

Large and complex castings in steel are more than a matter of the mold. Planning, designing and engineering must be big in concept . . . bold in execution . . . to match the needs of progressive railroads and general industry.

At its great, modern plants, General Steel never ceases to enlarge and improve upon the unique experience and skills it has to offer its customers. Commonwealth one-piece cast steel products have become the standard for railroads and other users throughout the world.

Build with Commonwealth products . . . on your road to lower maintenance costs.

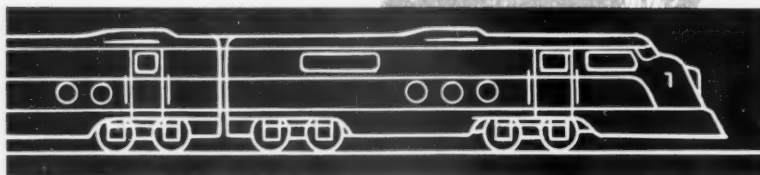


*125-ton depressed center flat car. The Commonwealth one-piece underframe provides maximum strength with minimum weight, low platform height for easier loading of higher loads. Completely spring-borne Commonwealth 6-wheel equalized trucks, specially designed for high-capacity freight cars, assure safe, economical operation.*

# GENERAL STEEL CASTINGS

GRANITE CITY, ILL. • EDDYSTONE, PA. • AVONMORE, PA.

**THEY  
EAT UP THE MILES...  
NOT THE  
COMMUTATORS!**



There's a Stackpole brush grade for every type of equipment . . . and every kind of operating condition.

**STACKPOLE**  
diesel-electric  
**BRUSHES**



**STACKPOLE CARBON COMPANY**  
St. Marys, Pa.

## Personal Mention

(Continued from page 18)

**Denver & Rio Grande Western.**—Burnham, Denver, Colo.: R. R. BARBEAU, assistant car foreman, appointed assistant general car foreman. G. L. CRISTOFANO, assistant electrical foreman, appointed electrical foreman, car department.

**Elgin, Joliet & Eastern.**—DOMENIC J. GENESIO appointed car foreman at Joliet Ill. CLIFFORD C. BROOKER appointed car foreman at Kirk Yard.



F. L. Hoffman

**New York Central.**—F. L. Hoffman, who has been appointed general superintendent of diesel-electric shop, Harmon, N. Y., as announced in September, attended Pratt Institute (1930—Industrial Mechanical Engineering). Started with NYC at Avis, Pa., in 1922 as a laborer. Subsequently became machinist helper; machinist apprentice; special apprentice terminal foreman at Newberry Jet., Pa.; assistant terminal foreman, Avis; terminal foreman, Corning, N. Y.; assistant master mechanic, Buffalo; master mechanic, Buffalo; assistant district manager of equipment, Detroit; industrial engineer, Detroit; master mechanic, Indianapolis, and master mechanic, Harmon.

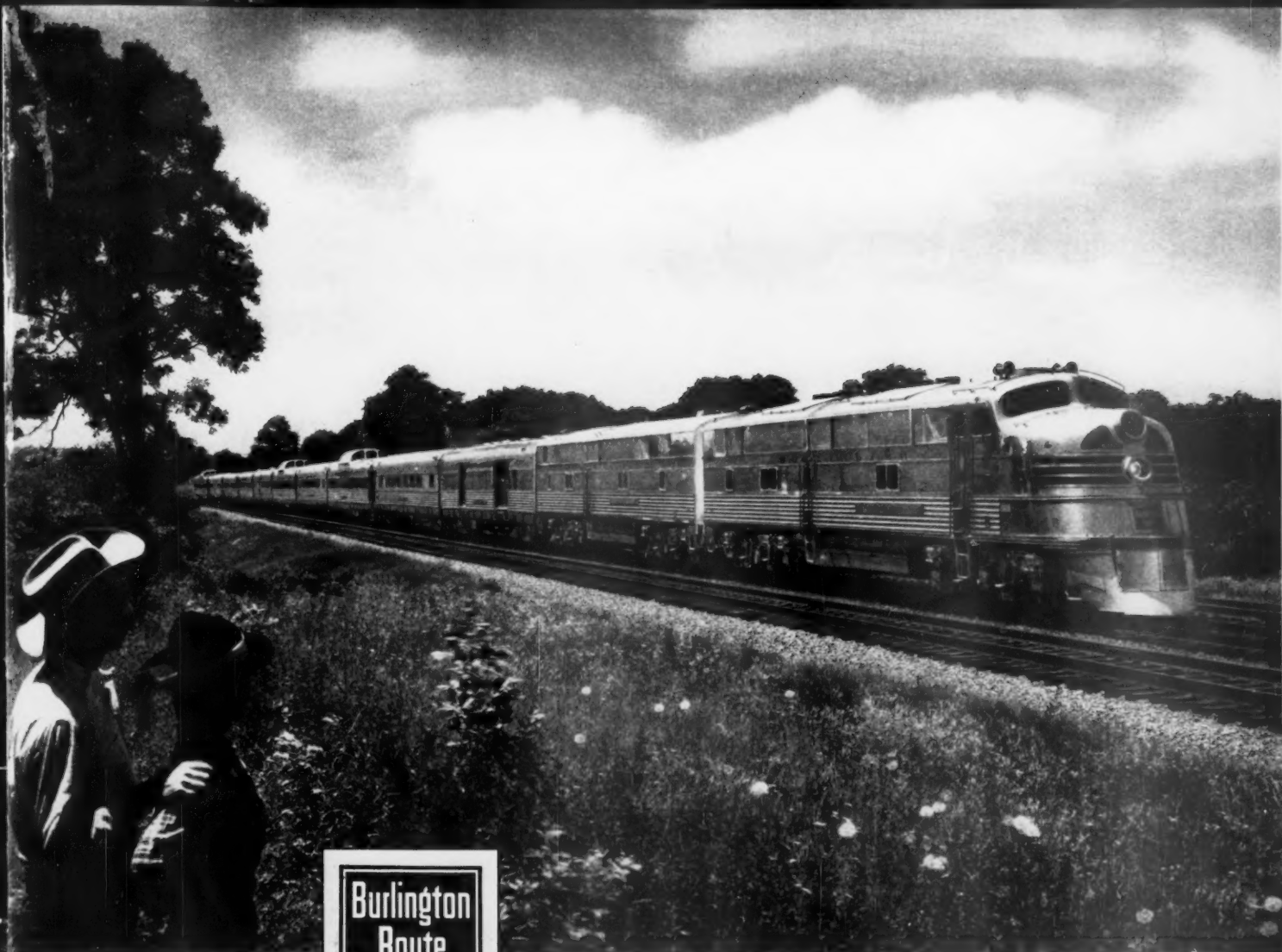
**Norfolk & Western.**—A. J. GRAHAM, JR., appointed to new position of assistant enginehouse foreman, Shaffer's Crossing, Roanoke, Va. D. C. FOSTER foreman of erecting shop at Portsmouth, Ohio, succeeds Mr. Graham as foreman at Iaega, W.Va.

**Southern.**—JULIUS A. ISAACS, assistant engineer quality control, Hayne Shop, Spartanburg, S. C., appointed general equipment inspector, Washington, D. C. CARROLL H. SHELHORSE appointed assistant diesel superintendent, Washington, D. C. GEORGE I. PARRISH appointed foreman, Danville, Ga. HANSFORD M. COWART, JR., appointed assistant foreman at Atlanta, Ga. W. H. McMICHAEL appointed assistant foreman, Spencer, N. C.

## Obituary

JAMES M. NICHOLSON, 69, retired mechanical and research engineer, Atchison, Topeka & Santa Fe, died August 25 in Topeka.

S. M. VILLE, who retired in 1952 as assistant electrical engineer, Pennsylvania, died September 3 at Blowing Rock, N. C.



## *The New Vista-Dome Denver Zephyr*

A train with many advanced features, Burlington's shiny new Denver Zephyr links Chicago with Denver and Colorado Springs. A popular Zephyr innovation is the Slumbercoach, which offers low-cost room facilities to the coach traveler. Other attractions include the Vista-Dome cars and the authentically western Chuck Wagon car.

Bethlehem wrought-steel wheels and forged-steel axles are part of the standard equipment. This continues a practice of long standing, for the original Burlington Zephyr, back in the Thirties, was also equipped with Bethlehem wheels and axles, as were others that followed.

Today's Bethlehem wheels and axles are the finest ever to come from our shops—more rugged, more durable than ever before. They can be installed with full confidence, for they return a dollar's worth of service for every dollar spent. You are invited to discuss present and future needs with our representatives.



BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

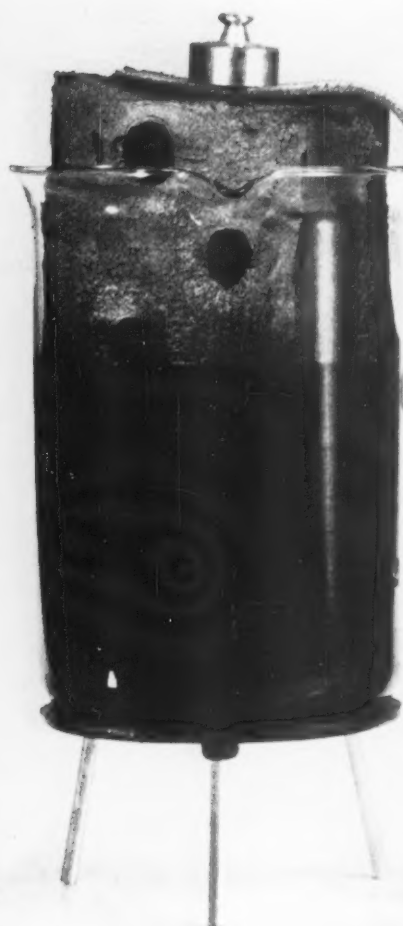
On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

**BETHLEHEM WROUGHT-STEEL WHEELS**

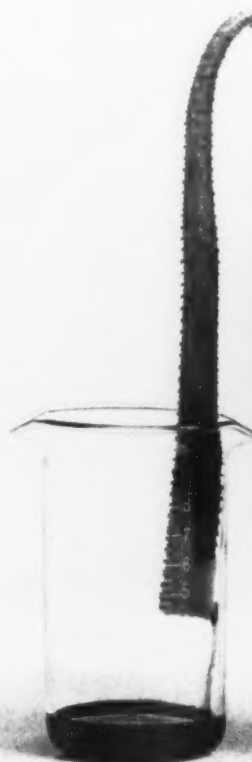
COMPANIONS TO BETHLEHEM FORGED-STEEL AXLES

FREIGHT • PASSENGER • DIESEL



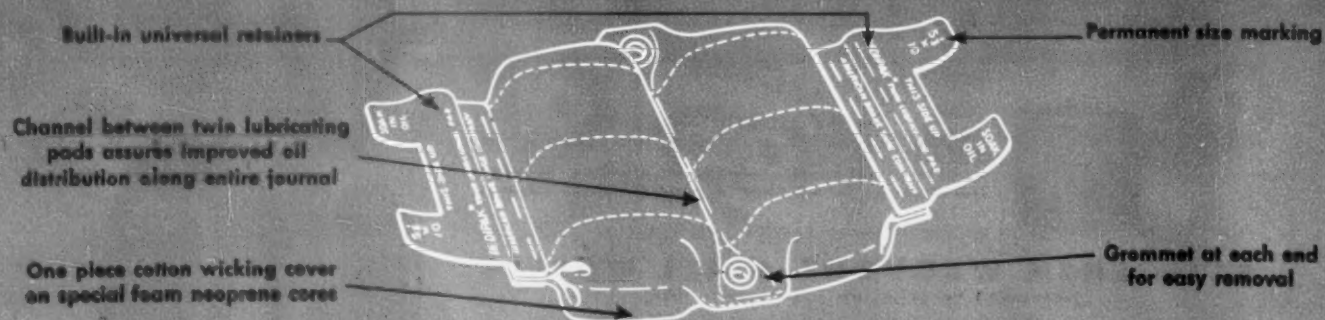


foamex core



woven  
cotton cover

**Both core and cover wick oil!** Both the cotton cover and the Foamex core in Redipak Twin lubricating pads move a steady flow of oil to the journal. The woven cotton cover, unmatched in wicking ability, is lint-free. The foamex core not only provides the proper resilience, but it, too, wicks oil when saturated . . . all adding up to doubly effective lubrication!





# Why Redipak<sup>®</sup> Twin Pads with **Firestone<sup>\*</sup> FOAMEX<sup>®</sup>** provide superior lubrication

Superior lubrication that will effectively control hot boxes is assured with Redipak Twin lubricating pads, because of their unique design and the excellent lubricating properties of their woven cotton covers and Firestone Foamex cores.

Take the Foamex core . . . more than just a mechanical filler, this material, which is produced by Firestone to our physical specifications, actually wicks oil when saturated, holds over five times its own weight in oil, and keeps its shape and resiliency under extremes of temperature.

The wicking ability of cotton hardly needs explaining. When woven into a seamless cover for Redipak Twin pads, the result is a highly efficient wicking material that will not lint or glaze. Add to these

properties, a unique design that provides superior oil distribution and positive shift prevention and you have Redipak Twin lubricating pads.

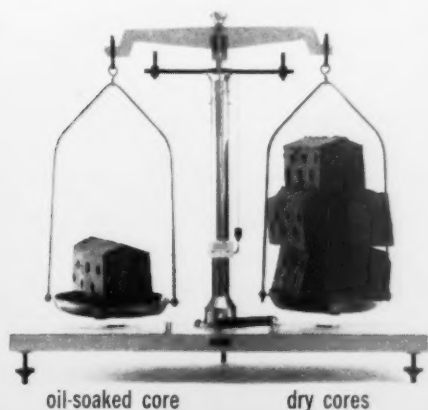
\*A special formulation of Foamex is used for Redipak Twin pads.



RAILROAD PRODUCTS DIVISION  
530 Fifth Avenue • New York 36, N. Y.

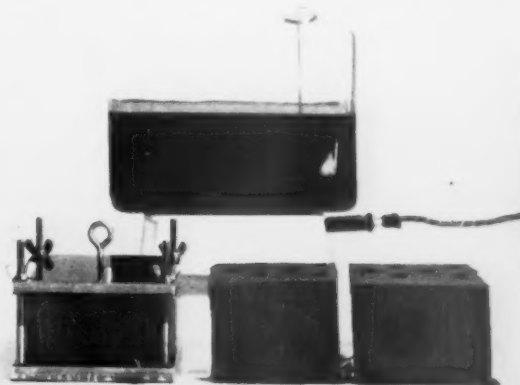
*Redipak's Foamex core holds over 5 times its weight in oil!* Redipak Twin lubricating pads hold an amazing amount of oil. Why? Mainly because of the Foamex core with its millions of interconnected cells. One sample of oil-soaked Foamex weighs as much as five and one-half dry samples of the same size . . . in other words five times its own weight in oil. Thus, the Redipak Twin core provides a generous oil reservoir—even when there is accidental loss of free oil.

*Redipak Twins keep their shape:* The Foamex cores in Redipak Twin lubricating pads are produced to our physical specifications to resist taking a set under extremes of temperature. In this demonstration, adapted from actual production tests, one of two identically-sized samples has been compressed to 80% of its original height and immersed in oil at 250° F for 18 hours. At the end of that time, there was no difference in height between the tested sample on the left and the untested sample on the right. Despite compression under heat, the Foamex core held its shape.



oil-soaked core

dry cores

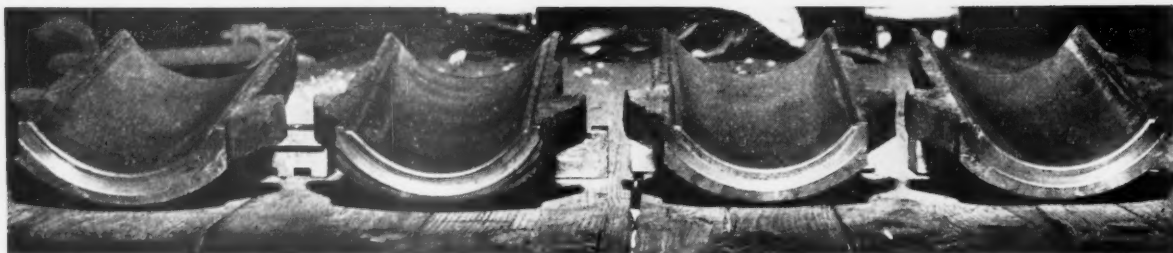


compressed core

18 hours

0 hours

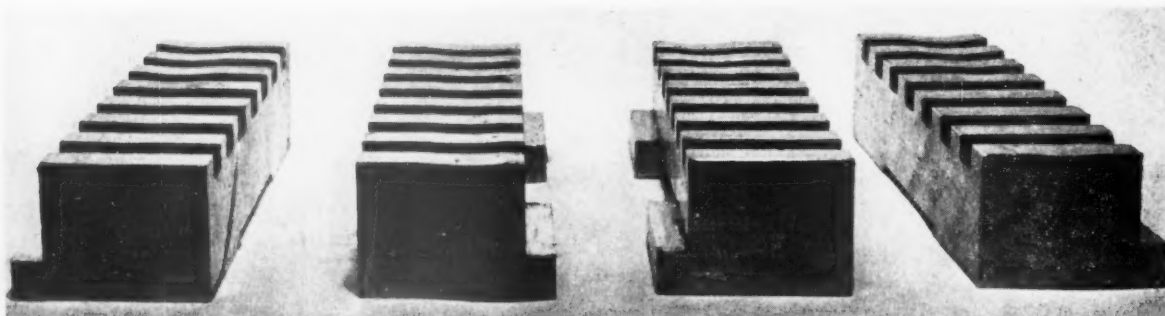




↑ **MAGNUS SOLID BEARINGS and R-S JOURNAL STOPS**

the ideal combination for

**YEARS OF LOW COST  
TROUBLE-FREE SERVICE** ↓



*Records prove you get the best possible bearing performance for lowest investment and maintenance with R-S Journal Stops and low-cost Solid Bearings*

**L**AST March 20th all bearings on both ends of SL-SF L #96082 were removed for inspection after over 5 years of continuous service. This was the original test car equipped with R-S Journal Stops. One end had been equipped with Stops on December, 1951; the other had no Stops . . . but was identical in every other respect.

All four bearings on the Journal Stop end showed only slight end wear and perfect bearing area on the lining surfaces, and were *reapplied* for further service! As of March 21, 1957, these bearings had been in service for 63 months, with approximately 155,000 miles of travel. All bearings from the end not equipped with Stops showed normal wear after only 11 months and had to be replaced. The Magnus solid journal

bearings and R-S Journal Stops from the original test car are shown in the unretouched photos above.

Now, more than 5,000 cars are R-S Journal Stop equipped — in 78,000,000 car miles have averaged better than 6,000,000 miles per hot box from *all causes*.

Bearing-wear records like these are possible because Stops eliminate the major cause of bearing trouble — excessive fore-and-aft movement of the journal within the box. Excessive axle displacement is positively prevented. Bearing, wedge and lubricator stay in place *all the time* — assuring an uninterrupted oil film.

For complete information on R-S Journal Stops, write to Magnus Metal Corporation, 111 Broadway, New York 6; or 80 E. Jackson Blvd., Chicago 4.

**MAGNUS**  
**Solid Bearings**

**MAGNUS METAL CORPORATION** Subsidiary of **NATIONAL LEAD COMPANY**

**Coordinated Meetings****Attract 1,700 Railroad Men**

*Sessions of the four Coordinated Mechanical Associations at the Hotel Sherman, Chicago deal with country's mechanical problems—Hot boxes lead the list; operating phases of diesel locomotives and the question of personnel follow*

The 1957 meetings of the Coordinated Mechanical Associations — the Air Brake; the Car Department Officers'; the Railway Fuel and Operating Officers' and the Locomotive Maintenance Officers' together with the exhibits of 136 companies that are members of the Allied Railway Supply Association held the center of the stage at the Hotel Sherman, Chicago from September 15 to 18 inclusive. Those who have followed these meetings were agreeably surprised by the registered attendance of 1,729 railroad members and

guests and supply men who were in attendance at the exhibits. The more than 1,700 railroad men who attended these sessions represented about 36 per cent of the 4,868 mechanical men who are paid members of these four associations.

The three-day technical sessions offers the membership 39 technical reports and 20 addresses on a variety of subjects. Abstracts of several of these reports and addresses appear in the following pages. The newly elected officers of the associations are listed on page 32.

**Who Is "They"?**

*(Stuart Schumate, RF&P, before the Car Department Officers')*

I FREQUENTLY HEAR CAR DEPARTMENT OFFICERS say "they" won't give us time to properly inspect the equipment. I am not sure who "they" is, but let me say to you that who ever he is, there is no time available for him to give. The competitive situation today from the standpoint of time and service does not permit more time, in fact, everything points toward the necessity for reducing the time now allotted for mechanical operations. Let's face it then, what can we do about it? For your consideration, there are five possibilities to improve overall transportation service.

**Rearrange Forces**

Arrange forces in such way that more men are available on the arrival of trains at the yard to expedite the inspection. You may say that's easy, we can hire enough men to give fast inspection, but the cost would be prohibitive. One way to provide more men for inspection on the round the clock basis is to make car inspectors out of all of your shop forces and instead of working all shop forces on a one trick basis, divide the existing forces for a three trick operation. In this way the shop

cars would be expedited and there would be more men available on the night tricks for an expedited inspection when necessary. It seems to me that it is absolutely necessary that we repair cars around the clock. Today's shippers will not accept delays of from 24 to 40 hours for repairing a car which results from a one trick operation of a car repair track.

**Repair Minor Defects**

More emphasis could be placed on repairing minor defects while the car is in the train rather than take the delay and the cost of the crew to shift the car out and place it in the shop. On the RF&P we have a motor car with the tools necessary to make minor repairs. This motor car is run along side the train and when the inspectors find a hot journal, for example, the motor car goes to that location and makes the necessary repairs while the inspection of the train is being completed. Oxygen and acetylene are available on the motor car and it is amazing how many repair jobs are being made in the train with the result that the car is expedited through the yard and the expense of the yard crew shifting the car out of the train, handing it to

and from the shop and placing it in outbound train, is saved. This motor car is also used to expedite the air brake inspection for outbound trains.

The third item which seems to me should receive more wide spread use is the pit inspection of trains as they enter the yard. With the use of present day hot box detector and a well lighted pit, with an inspector on each side of the train the inspection overall time could be materially reduced. There are many objections each of you can cite for such an inspection. Each time I see a car inspector at night with a little hand light attempting to inspect a car in the rain or snow walking along the side of the train, I am impressed with how much more this man could see if he were located with relation to the car with good lighting and necessary equipment to observe the train as it passed over a pit at the yard entrance. Maybe a compromise between the pit and walking inspection is the answer, but this is an area to which you might well devote some real study.

### "If they'd give me the money . . ."

The oft-heard remark among car department officers is: "I could shop 9 out of 10 cars in that train if I wanted to." Now if this is the situation it is time something was done about it. Your first reaction probably is "If they gave me the money I could fix it." Here again we have that mythical vagueness and here again our friend "they" has no more money to use than he had time in the first item mentioned. So the problem is back in your laps. It seems to me the problem should be faced realistically; if we are expecting car inspectors to run certain cars, let's correct this situation. Practice preventive maintenance and place the responsibility where it belongs. By leaving such matters to the judgment of the car inspector who varies so greatly in ability and judgment, we are not being realistic. I have often thought it would be advisable to have a car inspector foreman who had the necessary ability and authority pass on each car that is shopped. You could then insist on uniformity of shopping and such things as permitting a load to go to destination if it were safe and make the necessary repairs after unloading. Other than for penalty defects and unsafe conditions, no loaded car should be

shopped. Repairs to the greatest extent possible must be made to the empty cars to prevent delay to the shipments of our customers. With a uniform inspection we could get away from the tendency that now exists to shop sufficient cars to keep the existing shop forces busy.

### Too Much Lost Motion

There is still too much lost motion in all departments on railroads today. A good architect when designing a house thinks through carefully all the activities that will go on in that house and then suits his drawing to those activities. Are you good architects? Is there any waste motion in your shop?

The labor costs of American railroads today is 47.9 per cent of the gross income and yet we say that a large per cent of the cars now being run should be shopped for attention. You should closely analyze the work of your shop in every detail toward the end that labor now wasted on unnecessary moves can be utilized toward putting these cars in the shape you would like to have them.

Let's face the fact that even if railroads are fortunate enough to get favorable legislation, it will still far from solve our total problem. We must accept the fact that "they" do not have all the time you want for inspection and "they" do not have all the money you want for repairing cars. Sure, we have problems, but we also have advantages. Let's capitalize on them and promise ourselves and our railroad that we are going to use our own God-given ingenuity to make the best of what we have to produce the kind of service the public demands.

### Manpower is the Real Problem . . . . .

*J. T. Daley, Alton & Southern, before the LMOA*

The lack of interest shown by college graduates in the railroad industry is perhaps understandable because of several factors that may be involved. There are the long hours. We are called upon to work different shifts, seven days a week. There is strong likelihood of living in different communities, compelling us to change family location and friends.

### Registration at Coordinated Mechanical Meetings

Association	1957	1956	1955	1953	1952	1951
Air Brake	161	275	169	192	135	280
Car Department Officers*	398	353	433	520	523	563
Locomotive Maintenance Officers*	694	652	717	950	840	1,017
Master Boiler Makers*	—	—	—	172	127	215
Railway Fuel and Operating Officers*	338	289	267	322	433	268
Electrical Section, AAR	—	—	—	—	205	155
Railroad Total	1,591	1,569	1,586	2,156*	2,263	2,498
Railroad Guests	138	20	110	—	361	—
Allied Railway Supply	1,578	843	1,522	869	1,003	1,152
Railway Electric Supply Manufacturers*	—	—	—	—**	305	168
Grand Total	3,307	2,432	3,218	3,025	3,932	3,818

\* Electrical Section met at Atlantic City

\*\* Atlantic City Convention in June—No exhibit at Chicago in September

NOTE: No Chicago meeting in 1954



Any man who meets these tests has a lot to be said for his loyalty to his company and his job.

For instance, the man who applies for employment first makes out an application form. He puts in writing his own qualifications and indicates to us his desire to be a part of the railroad industry. Then if accepted—and while he is gaining experience—we have the opportunity to watch his growth; his attitudes not only toward management but also to people he is associated with, how he reacts to criticism; his ability to create new ideas; and finally his ability to be his own critic.

What better place, then, is there to get our future leadership than among people who have indicated a strong desire to make railroading a life work?

Isn't it possible that we have overlooked a number of people who have great potentials? Why not give *them* the opportunity to obtain higher education? The way surely can be found to accomplish this. All we as an industry need is the determination to do this.

Isn't it true that we have a far better chance of keeping this employee after he has advanced himself in this way than we do with certain college graduates? Many of you have had the experience of hiring such men and then having them leave after they have acquired certain experiences and been called upon to take an assignment they may not particularly like, knowing they can readily gain employment in some outside industry?

Securing young, well-educated and ambitious men is not the only problem the mechanical departments are faced with—sometimes the larger problem is keeping good men after we get them. For years the people who have addressed these meetings have portrayed the value of a stabilized labor and supervisory force and have recommended more careful planning to wipe out the peaks and the valleys of the employment curve. But, if railway management can't find a way to prevent experienced personnel from migrating from the railroad field to other industries every time there is a shut-down due to a drop in business the end result, over a period of time, will be a gradual deterioration in the quality of personnel and a consequent increase in maintenance costs. This problem of manpower, especially for the future, overshadows almost every other problem in importance. Yet, little progress seems to have been made.

## Co-operative Approach to Safety . . .

*R. M. MacDonald*

*(Director of Operation,*

*Board of Transport Commissioners for Canada)*  
*before the LMOA*

To say that the inauguration by railway management of safety meetings with employee groups was at first attended by an evident lack of enthusiasm is to put the case mildly. Happily, however, these get-togethers are now the order of the day on all railways in Canada and they are providing an effective medium of safety education mainly because of this direct and first-hand approach to the working habits of the individual employee.

It seems timely, indeed, that such a practice took root during the period when accepted and long-established railway patterns began to take on a new concept. It is significant that the inauguration of the

informal conferences by our Branch of the Board in Canada also took place around the same period.

Let us look at how these conferences developed and what they have accomplished. One of the obligations of the Board of Transport Commissioners' Operating Branch is to investigate accidents involving collisions between trains and motor vehicles at public crossings with a view to providing greater safety. In this connection the Railway Act deals specifically with the question of warning devices and their use by train crews approaching public crossings. Because of the relatively large number of unprotected crossings in Canada this is recognized to be one of the important factors in the Board's investigation of such accidents.

Following the introduction of the diesel electric unit in Canadian main line service, attention was soon focused on the incidence of a series of crossing accidents in which the driver of the highway vehicle failed to associate the sound of the warning signal with that of an approaching train. The Board's investigation clearly established that this was a contributory factor in causing the accident. It was evident that the situation demanded prompt remedial action.

With the object of reviewing all aspects of the situation, a conference was called by the Board's Operating Department. This conference was attended by representatives of the Railways, the Railway Supply Industry, representatives of the National Legislative Committee of the Railway Transportation Brotherhoods, together with skilled technicians in the field of sound from the National Research Council.

The conference culminated in substantial agreement being reached to the effect that an effort should be made to produce an air whistle which would more faithfully simulate the sound of the conventional steam whistle with which the public had become so familiar over the years. Following a recommendation made to the Board, in this connection, General Order No. 753 issued directing the railways, within a stipulated period, to equip diesel electric motive power units operated regularly in road service, with horns having tonal characteristics simulating the sound of the conventional steam locomotive whistles.

In due course experiments were conducted with substantially the same representation in attendance. Individual types of horns were finally approved on the basis of actual field listening tests and it is to the credit of the Railways and the Railway Supply Industry that suitable horns were manufactured and installed within the prescribed period. The real significance of this development, however, lies in the fact that the ratio of public crossing accidents associated with a misunderstanding of the warning signal diminished very perceptibly following this modification of the warning device.

All this was accomplished in a relatively short period of time and undoubtedly the conference approach to the problem providing as it did an opportunity of frank and candid discussion on all aspects of the situation was directly responsible for the production of what we consider to be a sensible and realistic regulation.

This Order has not been cited because it represents an outstanding example of the results of roundtable discussions on matters involving the railways and the Board. This is but one of several of the benefits which

have issued from these informal discussions between management, labor, and representatives of the regulatory body.

Within the past year conferences have taken place with respect to the proposed adoption of uniform air brake regulations. As a result of these negotiations it is anticipated that a Uniform Code of Air Brake Rules, acceptable to the Board, will be introduced on Canadian Railways shortly.

In some instances, this informal approach to safety objectives has involved a committee comprised of representatives of the Railways, Railway Employees and the Board contacting manufacturers and suggesting improved safety factors in the design and structure of certain components of railway equipment.

As a case in point, I might mention the strengthen-

ing of the nose door on diesel electric A-units designed to provide greater protection for the occupants of the cab in the event of a collision at a public crossing. This action, which was instituted in Canada in 1954, was timely indeed. Although we had remained comparatively free of such accidents in Canada up to the end of 1955, the past year has witnessed 10 serious collisions at public crossings involving highway vehicles carrying gasoline and other dangerous commodities. It is gratifying to find from the investigation of these accidents that where diesel A-units were involved, the strengthening of the nose door did play a significant part in providing some additional protection to the employees in the cab.

This was accomplished without the necessity of any formal action on the part of the Board.

## 'Spot' Car Repairs Gaining Popularity

Close coordination between mechanical and transportation departments was urged by the recent CDOA report of the committee on light repair tracks and train yard operation. Coordination should be achieved, the report continued, to have shop cars promptly placed on repair tracks and repairs made promptly to release cars for continued movement.

Modern tools, mechanized materials handling and location of material storage areas were all cited as points to be explored for expediting car repairs. The group placed major emphasis on around-the-clock operations or repair facilities, sheltered operations, and the "spot" repair system.

"The spot or progressive system of freight car repairs greatly increases the output of the car repair force. The saving is even greater if work is done inside a modern, well-lighted car shop with overhead traveling cranes; or under cover protecting the car men from the elements."

Overhead cranes can do much to speed light repairs, and if they are impractical, air jacks, lift trucks and small mobile cranes are used to good advantage. The committee urged that fully assembled trucks be kept on hand for system cars, rather than to hold the car for installation of individual wheel sets.

### Southern's Method

During discussion, C. Kimball, chief car inspector, Southern, described his railroad's new repair facility at

Birmingham, Ala., Birmingham is a complete "spot" system with all work performed in a 20-ft space on the repair tracks. Materials are kept on skids for ready movement to these repair operations. The repair area is under cover and there is no necessity for car men to leave the work area.

There are no specialists in the Southern's Birmingham operation, according to Mr. Kimball. Two-man crews do the variety of operations involved in light repairs, including air brake cleaning, repacking, new wheels, and welding. Two men change wheels in 30 min. Switching locomotives only move cars to and from the repair facility with all movements there being completely mechanized. Even the blue flagging is an automatic operation.

At the repair apron are three hydraulic jacks along the track for handling cars. There are jacks along both rails, and a third jack between them. Air, gas and water are supplied through reel-mounted hoses at this point. Repair materials and operations are reported vocally by the repairing carman on a tape recorder for subsequent use in billing.

The operation is an around-the-clock one and the new methods have been working out well, according to Mr. Kimball. The Birmingham facility is now turning out 70 to 100 cars per day. It is the practice to make no repairs in the transportation yard at Birmingham because the Southern has found that it can switch cars out faster than it can get necessary tools and men to the bad order equipment.

## CDOA's "Hottest" Topic . . . . .

### Pads, Seals and Stops Cut Hot Box Rate

New lubricating devices and improvements in other journal box components were the topics of the CDOA car lubrication committee's report, and an ensuing spirited discussion. The committee states, "Waste has been thoroughly discussed in the past and we do not

think that we can add any further comments to this subject."

The report indicated that one major railroad's study indicated a present-day cost of \$140.00 per hot box. (Continued on page 30)

# Eight Ways to Abuse a Diesel Locomotive . . . . .

Excerpts from a talk by E. B. Rykoskey (B&O) before the Fuel Association

. . . . . and how to prevent them

## 1. Danger From Running Gear Trouble

There is no other single item I can think of that could result in a more disastrous accident than conditions arising with the wheels and traction motors on diesel locomotives. Engine crews should be impressed with the serious danger of a seized armature bearing, which results in a locked wheel. A repeated wheel slip indication or a repeated ground relay operation should indicate that trouble may be developing in one of the traction motors which could result in a sliding wheel.

Several derailments have been caused by seized armature bearings, resulting in locked wheels and false flanges. In one accident, over 100 persons were injured as a result of a locked wheel sliding for a distance of forty-seven miles. The train had been stopped several times by operators reporting fire flying from under the locomotive, yet the engine crew, either through negligence or lack of education, failed to realize that one of the wheels had locked and was sliding. It should be pointed out to engine crews that when the power plant is isolated or the traction motor cut out, the wheel slip indicator no longer operates, and extra precautions should be taken to make sure that all wheels are rotating. When in doubt, the train should be stopped and a member of the engine crew should stand on the ground and observe all wheels, to see that they are turning.

## 2. Failure to Understand the Engine

The most expensive piece of equipment on a locomotive is the diesel engine itself. It is equipped with safety devices such as over-speed trip, low lube oil pressure switch, hot engine alarm, etc. to prevent damage where trouble has developed. Crews should not attempt to restart an engine that has been shut down to low lubricating oil pressure, hot engine alarm, or other reasons, until the reason why the alarm operated has been determined. A good rule of thumb to follow is: if an engine will not start in 10 seconds, then something is wrong and further attempts should not be made to start it.

## 3. Improper Throttle Handling

Real damage can result to the electrical and mechanical equipment on a locomotive and the train itself if the throttle is not properly handled by the engineer. In steam locomotive days it was the common practice to pump the throttle when starting a train. On a diesel locomotive this results in opening and closing the power contactors under heavy load, which results in arcing and damage to these electrical components.

Before starting a train the engineer should familiarize himself with the train consist. He should know where the loads and empties are located and if it is necessary to take slack before starting. Attempting to start before brakes are properly released or slipping excessively from bad rail conditions is responsible for electrical damage to the traction motors and main generator. Excessive slipping often results in flashing of the motors and main generator. Crews should realize that if they do not understand the operation of the power contactors, interlocks and relays, they should not attempt to operate them by using flag stick. The load meter in the cab is used to indicate to the engineer the current measured in amperes flowing to the traction motors. The safe load range is usually clearly indicated on the instrument panel. No attempt should be made to operate the locomotive in the over-load range beyond the allowable time limit.

Definite instructions have been issued concerning the notching down of the throttle on crossovers. Yet, we still have damage caused by excess power being used on crossovers. These instructions should also include known track conditions, such as drawbridges that are rough enough to jar the brushes in the traction motors.

## 4. Improper Brake Valve Handling

Many units today are equipped with the dynamic brake. The crews should understand that flat spots on the wheels of the locomotive can result by using the independent brake valve when the dynamic brake is in operation. We all know too well what can happen in a long train by run-ins and run-outs due to improper brake operation. In using the dynamic brake the engineer should know the consist of the locomotive units and measure the safe dynamic brake load by the weakest unit in the group.

## 5. Improper Sander Valve Handling

We often call sand a necessary evil. While it aids in starting a train, by increasing the adhesion between the wheels and the rails, it causes untold damage to the electrical and mechanical equipment on the locomotive. In an attempt to correct the use of excessive sand we have installed front wheel sanders on the Baltimore and Ohio. This allows the engineer to use sand only under the leading wheels of the locomotive. It has not only saved sand but has also reduced locomotive maintenance. Elaborate lube oil and air filters were installed on locomotives but like any other piece of equipment they are not 100% efficient. Therefore, the less sand used the better chance we have of preventing it from entering traction motors and diesel engines. All doors should be closed at all times to permit the car body filters to function properly.

Most engine crews realize the damage to ring gears, motors and pinions from using sand under a slipping wheel. Never permit an engineer to drop sand under a slipping wheel.

## 6. Failure to File Information

No one is in a better position to detect mal-functioning of the equipment than the engine crew. They are with the locomotive when it is operating under full load at various speeds and they should be constantly on the alert and report intelligently to the shop forces any unusual conditions that existed on their run. Shop forces are not always in a position to make a thorough inspection of equipment under load. There have been many cases where definite indications existed and the crews, either through ignorance or neglect, did not make a proper report.

## 7. Excessive Speed of Operation

We are continually experiencing traction motor trouble due to excessive speed. Crews should be impressed with the fact that the gear ratio is very important in the limits that are imposed on the operating speed. A locomotive with 62:15 gear ratio should not be operated in excess of 67 mph. At this speed the traction motors are revolving at from 2,200 to 2,400 rpm. This traction motor armature speed will not be reached on a passenger locomotive until the speed is approximately 108 mph. Traction motor armature speeds are much higher on a freight locomotive than a passenger locomotive. Excessive armature speed will cause raised commutator bars, broken string and wire bands and gear damage to the traction motors.

## 8. Improper Care of Locomotive Cabs

One item of expense is the replacement of wind shields, caused by men placing their feet against them, resulting in scratches and general marring of the surface of the glass. This finally results in obstruction of vision and causes a safety hazard. Other damages in the cab include fire extinguishers, water coolers, speed recorders and braking equipment, usually caused by men resting their feet upon this equipment. Another major item of expense is the repairs to cab upholstery, including the seats, arm rests and back rests. Sharp objects should not be carried in pockets that tear the seat upholstery.

## Pads, Seals and Stops

(Continued from page 28)

The committee went on to report, "We cannot assume that these lubricating devices are going to be a cure-all. There are so many factors involved in causing hot boxes other than lubrication."

Shortcomings of existing lubricating devices reported include collapsing cores, breakdown of pad suspension springs, disintegrating of the pads from improper sewing, and a tendency to rotate around the journal. This rotation has been prevented in some cases with waste retainers but it had been found that the pressure of the retainer tends to restrict the flow of oil. "This particularly applies," the committee reported, "to pads where the oil feed is around the pad."

One railroad with 20 years experience with pad lubrication for steam locomotive and passenger car journals reports that hot box coolants do not work well with pads and advises that the overheated pad be removed and replaced with waste before the coolant is applied and further movement is attempted. "Waste," the committee concluded, "will still have its place on the railroad, replacing the pad when a hot box occurs."

### Better Seal Needed

Increase in ambient temperature and decrease in lubricating oil's viscosity and load-carrying ability during summer months may cause small journal and bearing defects developed during previous cold months to operate so that hot boxes develop. Some railroads are using a premium grade of car oil made from greatly improved base stock with extreme-pressure and oiliness additives which increase the thickness of the oil film and its load-carrying ability. The committee reported, "Such an oil assists in keeping the running temperature of car journal bearings having small defects to as near normal as possible."

"The present AAR dust guard seal is totally inadequate in attempting to perform the function it was designed for," stated the committee. They went on to report increased oil consumption with pad-lubricated cars, and said that this was an acute situation on car dumpers. In deserts, the life of lubricator pads is greatly reduced without adequate front and rear seals. The fine dust will make the ad inoperative, or it will be filtered out of the oil in the wicking medium—eventually clogging this and leading to failure.

### Journal Stops Endorsed

Return to the pre-war journal bearing,  $\frac{1}{4}$  in. longer, will cause the excessive lateral in older trucks to be "somewhat corrected", but axle stops will be necessary to control the "fore and aft" movement of the axle in the journal box. In addition to being necessary for proper operation of the rear seal, the committee states that "longer journal bearing life will be obtained because axle stops will prevent the pounding out of the lining metal and also retain lubricating pads in their proper position directly under the journal."

Detection of hot boxes on long trains is becoming more difficult. The adoption of an odor additive in the journal oil or a modification of the present passenger car odor bomb for freight service were urged as worthy of consideration.

William M. Keller, AAR, stated that earlier reports by the Norfolk & Western indicating three time better performance with pad-lubricated cars was confirmed by two other railroads. W. Faris, N&W, reported that the pad-equipped cars on his railroad had operated nine times farther per hot box than waste-packed cars during August. A. J. Schulte, Santa Fe lubrication supervisor, said his road is equipping 1,500 cars monthly with lubricators and now has 16,000 done. He warned that railroads should not plan on an extension of the January 1, 1960, date for mandatory use of lubricating devices in interchange. The Santa Fe operating experiences are comparable to those of the Norfolk & Western. Mr. Schulte paid respects to both railroads and suppliers who, he said, are doing a good job with lubricating devices.

### Wedge Is Problem

Mr. Schulte also called for more attention for the wedge and said that the AT&SF has found that the 50-in. wedge may be some better than the standard 78-in. radius wedge. Both he and another CDOA member from the Santa Fe stated that journal stops are a big factor in journal performance. Stops are essential for a successful rear oil seal, according to Mr. Schulte and "Savings in bearings alone will pay for the stops".

A Leask, Southern Pacific, cited his railroad's experience in finding 121 misapplications of controlled-clearance bearings in a two-month period. He said that his road, instead of using the "A", "B" and "C" designations for identifying bearings, is using the final numbers of "2", "7" and "9", from the sizes stamped on the bearings. These are the same for the four bearing sizes and correspond to the letter designation.

### Hot Box Experiments

W. A. Mullen, B&O, told of his railroad's experimental work in finding the causes for hot boxes. The B&O has been operating a special train composed of a locomotive, a 50-ton hopper loaded with 54 tons of scrap iron, and a caboose with recording apparatus. Records were made on a 16-channel oscillograph of temperatures in the axles, bearings and at the top of the box. All packing was removed from test boxes on the hopper and the train was operated at 35 mph.

Within six miles the car had a hot box; the brass broke within 12 miles; the journal wore through the wedge in 20 miles; and the temperature of the axle was 1,800-deg F in 28 miles when the test was stopped. At the conclusion of the test the temperature was going up at the rate of 200-deg F each 30 sec. Further work was to be done and may even include burning off an axle. Among things to be checked is the copper penetration caused by this overheating.

W. M. Keller summarized his talk on the journal bearing situation by stating that progress is being made but that developments must lead to arrangements which require less servicing and less attention. The committee warned that the present hot box situation can well lead to the eventual mandatory use of roller bearings.



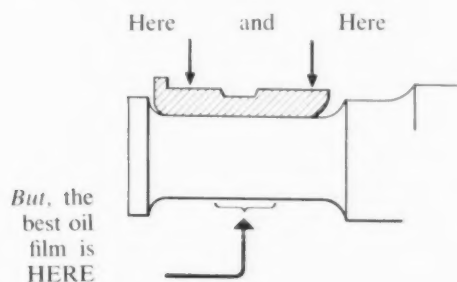


## Here Are Some Things W. M. Keller Told CDOA About . . .

### Plain Bearing Journal Boxes

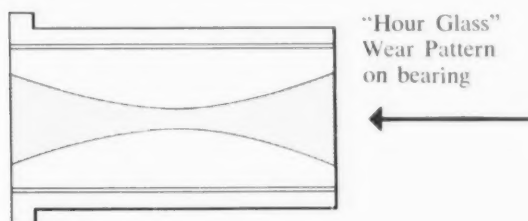
During a brief chalk talk before the recent Car Department Officers Association, W. M. Keller, AAR Assistant Vice President and Director of Research, discussed some of the principles and pressing problems involved in the present plain bearing journal box.

① Grooved back in center of the present journal bearing puts the loads . . .

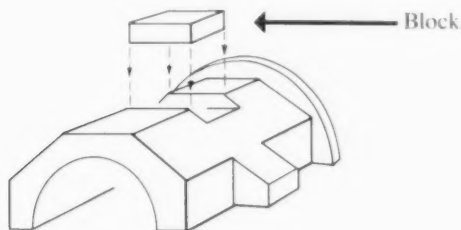


SO, the grooved back puts the loads on the surfaces with the *poorest* lubrication.

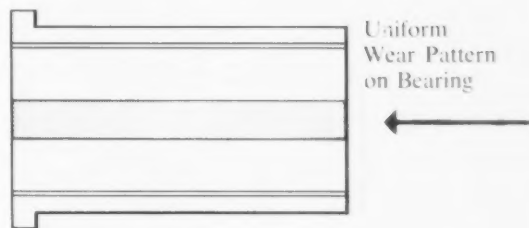
② Norfolk & Western looked at typical wear pattern for this standard journal loading arrangement . . .



Then, N&W applied a block in the groove on the center of the back of the bearing so the load was applied at the center . . .

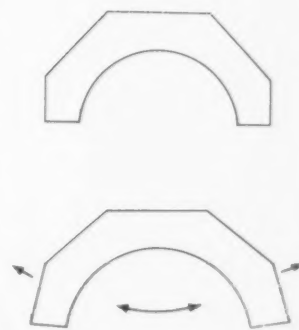


Tests then showed the N&W that a uniform wear pattern was produced with this "central" loading.



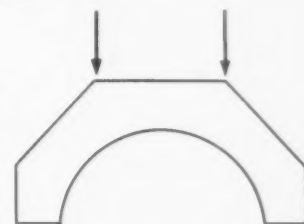
③ Standard journal bearing installed on a cool journal will be 50 to 100-deg hotter after the car has run only a short distance and even though the bearing is operating properly.

The shape and design of this casting can cause it to open up when it heats to normal operating temperatures. When it cools after this there is the remote possibility that it might "seize" on the journal.



④ Along with uneven loading along length of the journal (Part 1), the AAR has been finding it to be undesirable to have anything but central loading across the diameter of the journal.

This is approximately the loading that comes from the present standard 78-in. radius wedge.



⑤ AAR sees 50-in. radius wedge as a method for achieving "central" loading across the journal, *but* a change in the back of the bearing would be necessary to produce "central" loading along the journal. Among Mr. Keller's other points:

(a) Return to pre-war bearing  $\frac{1}{4}$ -in. longer cannot be complete solution for excessive lateral which can reach a total of  $2\frac{3}{8}$ -in. in a worn truck.

(b) Railroads "don't have much of a seal now" for back of journal box. The AAR-designed dust guard has been tested for movement on and off the dust guard seat and has operated well. Without journal stops, any type of rear seal must be watched because of possible damage during severe car impacts.

## Officers Coordinated Mechanical Associations 1957-58

### Committee of the Coordinated Associations

*Chairman:* J. L. Robson, chief mechanical officer, Great Northern  
*J. A. Welsch*, general superintendent motive power, Illinois Central

*T. T. Blicke*, general manager-mechanical department, Atchafalaya, Topeka & Santa Fe  
*Secretary:* J. D. Ristine, 80 East Jackson st., Chicago

(Committee includes also the president and secretary of each of the coordinated associations)

### Air Brake Association

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*Vice presidents:*

*L. A. Stanton*, general air-brake supervisor, Great Northern

*A. M. Malmgren*, general diesel and air-brake supervisor, St. Louis-San Francisco

*F. R. Ellis*, general air-brake instructor, Reading

*Secretary-treasurer:* John B. Ball, 224 S. Lincoln ave., Aurora, Ill.

### Car Department Officers Association

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*Vice presidents:*

*K. H. Carpenter*, superintendent car department, Lackawanna

*J. F. McMullen*, superintendent car department, Erie

*C. E. Barrett*, superintendent car department, Chicago, Milwaukee, St. Paul & Pacific

*C. T. Graves*, assistant chief engineer-tank cars, General American Transportation Corp.

*Secretary-treasurer:* F. H. Stremmel, (assistant to secretary, AAR Mechanical Division), 6536 North Oxford avenue, Chicago

### Locomotive Maintenance Officers' Association

*President:* F. R. Denney, mechanical superintendent, New Orleans Union Passenger Terminal

*Vice presidents:*

*E. A. Myers*, superintendent motive power, St. Louis Southwestern

*W. E. Lehr*, superintendent motive power, Lehigh Valley

*O. L. Hope*, mechanical superintendent, Missouri Pacific

*R. E. Harrison*, supervisor diesel locomotive maintenance, Southern Pacific

*Secretary-treasurer:* C. M. Lipscomb, general clerk to terminal master mechanic, Missouri Pacific, 1721 Parker street, North Little Rock, Ark.

### Railway Fuel and Traveling Engineers Association

*President:* O. D. Teeter, assistant freight traffic manager, Denver & Rio Grande Western

*Vice presidents:*

*C. R. Patterson*, regional locomotive fuel supervisor, Canadian National

*C. M. Moddrell*, system supervisor, fuel and locomotive performance, Northern Pacific

*J. S. Swan*, superintendent motive power-operation, Louisville & Nashville

*Secretary-treasurer:* L. H. Peters, 139 West Van Buren street, Chicago 5

### Allied Railway Supply Association

*President:* C. R. Busch, vice-president and manager sales, Unit Truck Corp.

*Vice presidents:*

*Geo. L. Green*, vice-president, Pullman Standard Car Manufacturing Co.

*H. C. Hallberg*, president, Waugh Equipment Co.

*D. I. Packard*, president and general manager, Brandon Equipment Co.

*Secretary:* J. G. Rees, Westinghouse Air Brake Co., Wilmerding, Pa.

*Executive secretary:* J. D. Ristine, 80 East Jackson st., Chicago

*Treasurer:* C. E. Grigshy, vice-president—sales, American Steel Foundries

Union Pacific Has Answer to . . .

## Box Car End Liner Problem

Steel and wooden end lining consisting of a metal shape formed of dovetailed channels filled with wooden inserts, has been applied to 2,000 new box cars by the Union Pacific.

One of the most vexing problems in box car maintenance is the frequent necessity for renewal of broken and missing lining boards. The UP mechanical department decided there must be some way to provide an end lining that would be more substantial than the conventional tongue and groove or plywood lining. If this could be done, the supply of cars suitable for high class loading would be increased, car-days out of service reduced, damage to lading minimized, and the expense of frequent renewal of lining eliminated.

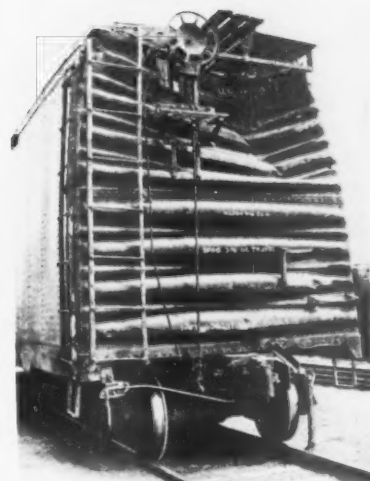
Working in conjunction with the Standard Railway Equipment Manufacturing Company's research and engineering departments, a design was developed that gives a more substantial structure, helps protect the lading, and strengthens the corrugated steel ends from damage caused by shifted loads. It eliminates the necessity for securing end lining by nails which frequently protrude and damage the lading

and provides a positive seal to prevent contamination from materials accumulated behind the end lining.

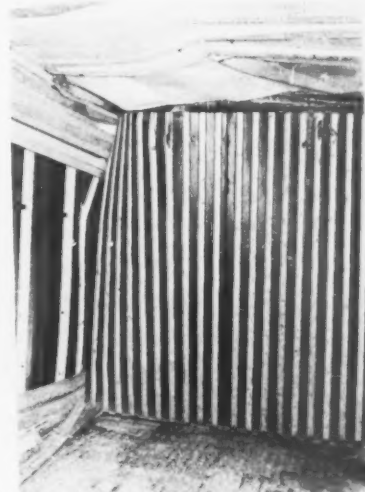
In a typical installation, the lining for each end of car is of four separate dovetailed metal shapes, each section being equal to about one-fourth of the inside width of car. Before installing, the dovetailed channels in each section are filled with wooden inserts which provide alternate metal and wooden sections facing the interior of the car. In this application, filler pieces used in the channels adjoining the side lining and in the channels where the sections are joined together, are applied after the sections are in place, being secured by countersunk stud bolts.

Another method of application is to assemble the complete end section and insert the filler strips in all dovetail sections before installing the assembly in car. Either installation permits the renewal of individual wood inserts without disturbing other sections.

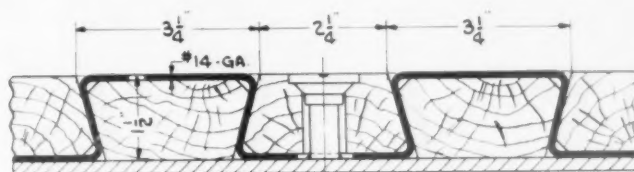
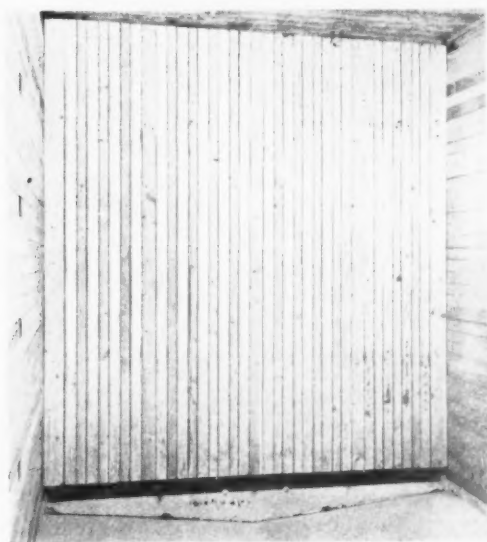
The cheaper grades of lumber adequately serve the purpose of the wood inserts. Oxychloride cement, plastic or similar materials can be substituted to fill the dovetail sections for nailing surfaces.



A terrific wallop . . .



And the end liner takes it



Filler blocks can't come out of channels. Countersunk heads eliminate projections on panel face and facilitate removal of broken inserts.

End panel of four sections is completely assembled for new car application. Recessed angle at top of car holds panel in place, with stud bolts at bottom.

Special Report to the  
United States Congress

Oct. 7, 1957

**RAILWAY AGE** weekly

# OUTRAGE

Keeping the railroads in chains  
is putting shocking limitations  
on America's development

50 cents A Semipermanent TIME SAVER Publication

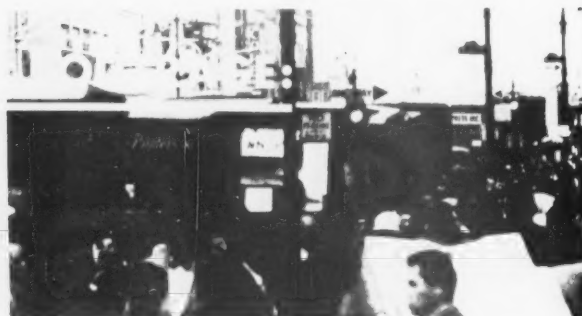
Government treatment of railroads is an OUTRAGE

## Laying Railroad Story on the Line

Restricted by an archaic system of regulation, taxed to near confiscation by unequal laws and forced to compete in a fairyland of subsidized competition, today's railroads are forced to do business under conditions like no other industry.

These were the cards put squarely on the table in the October 7 Railway Age—companion publication to this magazine. In a Special Report to Congress, Railway Age charged that competitors to railroads "have been given every card in the deck." No wonder railroad earnings are low, no wonder railroads have a tough time obtaining funds just to stay even. The page reproductions shown here illustrate how that message was presented.

The report stressed how railroads, in imaginative management, inventiveness and advanced engineering are second "to no other industry." But, the report said, railroads aren't allowed to do the job they could do because they're being choked to death "by inequalities and an archaic system of regulation established in the last century."



Who's kidding whom...



... that trucks, cars, and buses  
could carry the full load

The nation needs its railroads. They're the one really vital "low cost common carrier."

**Trains have been, are, and must continue to be the bedrock  
foundation on which America is built.**

Everywhere, there does the happy exodus of prosperity flow across the land. The nation's factories and farms take in vast stores of supplies and pour out goods in a fantastic river—a river that reaches into every city and hamlet. Yet every molecule of this output, every refrigerator, every barrel of oil, every grain of wheat must be moved from where it's produced to where it can be used. Without modern transportation, this country could not prosper. No other area of the world depends on transportation as North America does.

It is not difficult to assay the value of America's railroads today. They alone provide the really vital low-cost long-and-short-haul mass transportation. They keep prices from soaring, safeguard nationwide markets and protect millions of jobs. Without trains, steel coast trains would have no market in the east, prices of eastern products would soar in the west. Basic raw materials would skyrocket in cost. Take a look at a single figure to move a ton of freight a mile costs an average of 1.5 cents by rail, over three times that much by highway.

**The last war gave us a good look at the basic importance of  
trains. With autos rationed, gasoline rationed, tires rationed,  
where would we have been without our trains?**

Only railroads have the built-in capacity, the elasticity to expand swiftly, expertly and safely in wartime emergencies. It's small wonder the industry still talks proudly of what it did in World War II. Tanker trucks, or airlines, or automobiles, or other transportation agencies, the nature of the railroads enabled them to accomplish a modern transportation miracle. Faced with the same shortages, the same restrictions in materials and manpower, they swiftness their limited output to war production.

Look at the record: they moved nearly twice their prewar volume of freight and better than three times their pre-war passenger traffic. Without the railroads' inherent readiness and adaptability, America couldn't have made the grade. Detroit's tanks could not have won battles in Germany. If the wartime experience proved anything, it's the nation's stake in a strong and modern railroad system. The country simply must keep its defenses ready.

**Yet the railroads today are being choked to death by inequalities  
and an archaic system of regulation established in the last century.  
If this strangulation of our "low cost mass transportation carrier"  
continues, what will be the future of our cities, our highways,  
our defense, our ability to compete for world markets?**

What's happening to the railroads? Far from expanding, many of them are having to contract and curtail. There are today 40,000 fewer freight cars than just ten years ago. 7,000 fewer passenger cars than in World War II times. Trucks in service have doubled to 15,000 miles since 1940. To put it bluntly, the railroads are having a tough time trying to hold

their own to stay as big and as vital as they once were. An industry grows or it goes. Restrict the railroads, hold them back, keep them non-competitive in a competitive economy and who gains? Nobody, for very long. As railroads slide into a crisis of misunderstanding, deterioration and neglect, so does every producer and every consumer, every citizen and every city.

Just see how desperate the railroad situation really is—→



## What the Railroads (1) Can Do...

In imaginative management, inventiveness and advanced engineering, the railroads are second to no other industry. Just look

at some of the things they're doing:



Continuous rail

New kinds of rail, some welded some "friction joint" and even where changes are being effected, are laid every year. This is the kind of progressive action that railroads can take and must take.



More and better freight cars

Industry engineers abroad have the know-how and techniques to build a truly modern freight car fleet. However, merely keeping up with replacement needs poses a huge and involved financial problem.



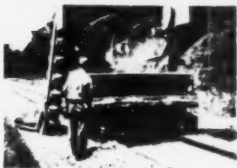
New trains, modern stations

The nation's trainless railroads realize could be served better with more top-quality trains and more stations with real "big faces" appeal. Waiting there to use these money to pay for them is another



Fast communications

Railroads train operation, modernized TV in yards and stations—these are examples of today's railroad tools. But to increase our railroads' value to the nation, such things are needed on a grand scale.



Better track

A giant machine works up ballast from the track shoulders and deposits it, as required, ahead of the engine. More equipment like this could cut ballast in shape for any distance, faster and



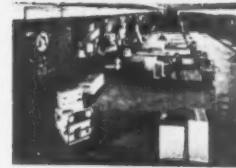
Versatile new transportation

Engineering is creating new traffic patterns. As transport needs change, railroads do change. Already, thousands of yards have entered the rail-holding company to broaden their service to shippers.



New ideas in traffic control

Improved track and signal devices permit great stretch track to be controlled from a single point. Trains keep moving, track is kept busy. These new ideas are growing, but they could grow faster.



Modern materials handling

Railroads spend all they can afford on new ways to handle freight—like this endless conveyor in a freight house. All that holds back hundreds of such installations is simply the shortage of money.

## ...and what they're (2) Allowed to Do are two different things

The plain fact is that they're not put their

allowed to make enough money to modern, advanced ideas into broad effect

Railroads are progressive and anxious to grow; only the lack of money holds them back.

**THRUWAY**

Built by public authority, tax-free, from proceeds of tax-exempt state guaranteed bonds

**OUTRAGE:**

**RAILROAD**

Privately built  
Privately maintained  
Taxed to the hilt by state, city, county, village and borough

**BARGE-CANAL**

Tax-built.  
Tax-maintained  
Tax-free  
No tolls at all

## How would you like to run a rail road under conditions like these?

The Competition has been given every card in the deck.

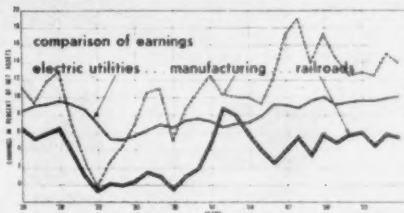
No wonder railroad earnings are so low

Take a good look at the chart opposite. Consider the story it tells. Railroad earnings (percentage of return on net assets) contrast sharply with earnings of the manufacturing industry and electric utilities over the past 31 years. Electric utilities have never earned less than 5 per cent—even at the bottom of the Thirties depression, at recent years 9 per cent has been the earnings "floor." The manufacturing industry had its bottom-of-the-depression share of relatively meager earnings, yet during postwar years its earnings have never fallen below 12 per cent. In the same 31-year period, railroad earnings have averaged less than 4 per cent; utilities, 6 per cent and manufacturing over 10 per cent.

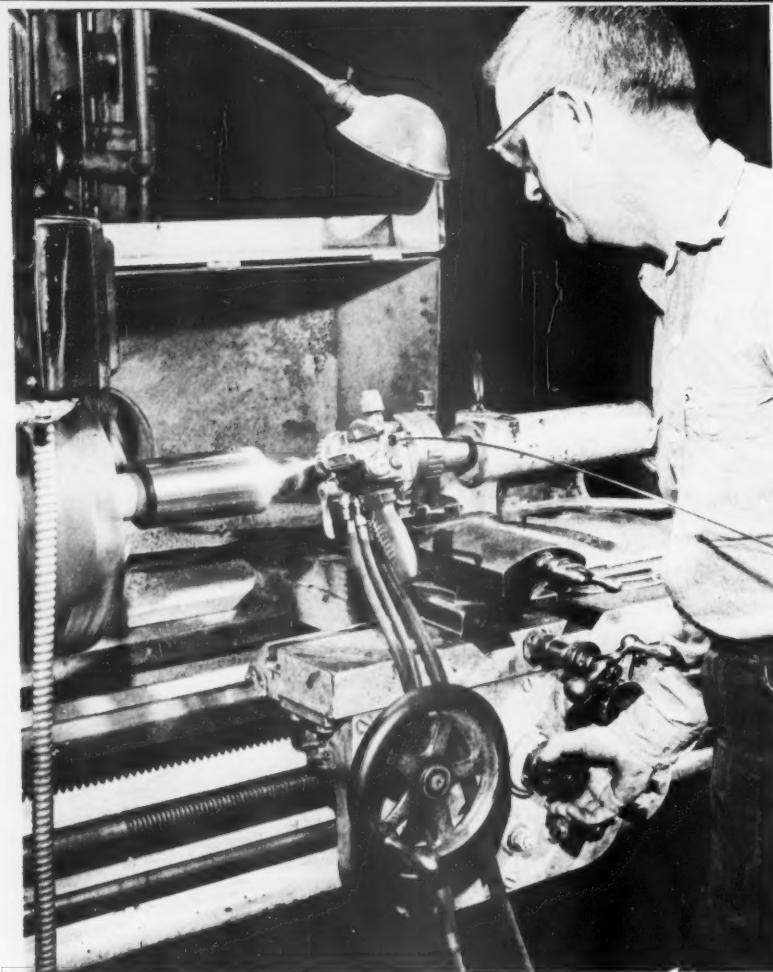
An industry that earns less than 4 per cent has a tough

time competing for available investment money with industries earning 8 or 10 per cent or more. Even the federal government is finding that out these days.

Why are railroad earnings so low? The picture shows only part of the story—how government financing of certain transport facilities ignores railroads by helping their rivals. Pick up almost any newspaper and read what's happening. Billions in taxpayer dollars are being spent for more and bigger highways, millions more for improved airports and deeper inland waterways. The rest of the answer lies in the severity of government regulation of railroads. A full 90 per cent of inland waterway traffic is exempt from control, so is 85 per cent of truck traffic. Railroads are regulated 100 per cent.



But what happens? Competitors continue to get government help and grow stronger all the time.



Metal spray is applied to wrist pin. Care must be taken to insure greaseless surface before spray is applied.

On the Milwaukee . . .

## Metal Spray Reclaims Engine Parts

Prior to April 1953 a large stockpile of pistons, cylinder liners and wrist pins were kept on hand at the Milwaukee shops in Milwaukee, to replace worn out assemblies in locomotives shipped for overhaul. After over four years' use of metallizing equipment developed by Metallizing Engineering Company, the company has made substantial savings in the cost of the reclamation of these parts, with a drop of over 95 per cent in inventory—now an inventory of only 200 is maintained. Similar reductions of other items have been accomplished.

Cylinder liners represent a feature piece of equipment now being reclaimed. With 6 to 16 liners in each locomotive, the replacement constituted a major problem for the  
(Continued on page 42)

### Here's What Another Major Railroad Saves by Metallizing

Name of part	Pieces per year	Replacement cost	Metallizing cost	Yearly savings
12-12-752-2 cylinder liners	50	\$15,091.50	\$ 490.00	\$14,601.50
608 Baldwin-Lima-Hamilton 52111B				
Alco 539 cylinder liners	50	7,440.00	490.00	6,950.00
752-2-Lima-Hamilton cylinder liners	50	6,750.00	490.00	6,260.00
AFB 652 E-C5				
F-M roller cap	300	16,830.00	2,010.00	14,820.00
8091536				
EMD blower shaft	24	386.64	191.60	195.04
814967				
EMD cam shaft	10	1,569.50	62.00	1,507.50
8085768				
EMD jack shaft	10	1,204.00	137.50	1,066.50
C-6822A 10 FB-B				
F-M injector control shafts	216	3,542.40	626.40	2,916.00

Total yearly savings — \$48,316.54

## HOW TO

# Learn About Air Brakes

... AND HAVE FUN DOING IT

24-RL Automatic Brake Valves

Installment 16

## D-24 MC Pressure Maintaining Brake Valve

*This is the seventh installment on the 24-RL Equipment in the Air Brake in Color Schematics series. For the 1F installment see Page 53 of the September 1957, issue.*

### First Service Operation (Sketch 18)

The first service valve has a spool valve with "O" rings in place of the older type plug cut-out cock. When the handle is moved to *IN* position, passage 14, which is feed-valve-supplied air, is connected through this spool valve (Piston) to passage 14a. This permits feed valve air to flow to the maintaining valve in the equalizing portion and maintains pressure against brake pipe leakage during first service applications. Passage 24a is connected through the spool valve to passage 24.

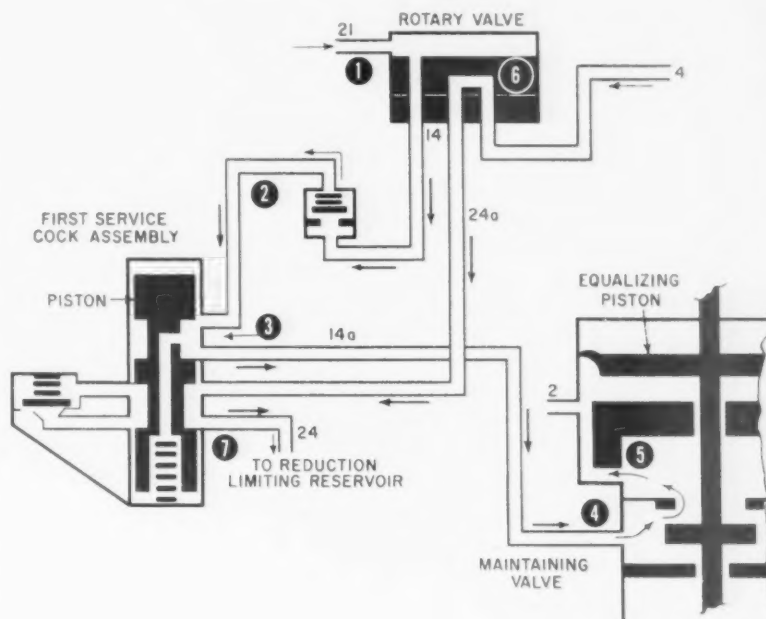
During a first service application, these passages connect equalizing reservoir from chamber *D* to the reduction-limiting reservoir for the purpose of obtaining a light controlled drop of chamber *D* pressure. When the handle is moved to its *OUT* position, communication between 14 and 14a is cut off, making it impossible to obtain a first service brake application.

Passage 24, however, is now connected through the spool valve and a ball-and-flat check to passage 24a. This connection is made so that reduction-limiting reservoir pressure can be reduced when it is desired to make a brake pipe reduction on top of a penalty brake application with the first service feature cut out. To color this sketch, proceed as follows:

With an orange pencil, color pas-

sage 21, the space above the rotary valve, passage 14 and through the right-hand check valve into the piston. Fill in both right and left hand cavities and go down through the

piston into the spring chamber, passage 14a and part way through the open maintaining valve in the equalizing portion. Dampen and allow to dry.



**Sketch 18**  
First Service Operation

1. Feed valve air through rotary valve, through passage 14 to under side of check valve in First Service Assembly.
2. Check valve to piston.
3. Around piston into passage 14a.
4. Passage 14a into equalizing portion beneath maintaining valve.

5. If maintaining valve is held open by the equalizing piston, maintaining air passes maintaining valve into passage 2b and 2 and to the brake pipe.
6. Equalizing reservoir air flows through rotary valve into passage 24a.
7. From passage 24a around the piston and into passage 24 and to the reduction limiting reservoir.

With the yellow pencil, start above the maintaining valve where the orange color stops. Fill in passage 2 and the space beneath the equalizing piston. Dampen and

allow to dry. With a light green pencil, fill in passage 4 and go into the rotary valve cavity. Dampen and dry.

With a dark green pencil, start

in the cavity where the light green ended. Fill in passages 24 and 24a, the cavity around the piston, and the space above and below the left-hand check valve. Dampen; let dry.

### Emergency Operation (Sketch 19)

Sketch 19 shows schematically the layout of the Emergency Valve, Rotary Valve, and Equalizing Portion when an emergency application is initiated by the brake valve. In this position, the rotary valve connects various ports and passages as indicated previously under "Rotary Valve Connections". The emergency valve plunger unseats the emergency pilot valve (not shown) which permits the emergency valve to quickly unseat and provide a large and direct passage from the brake and passage 1 to the exhaust, so that an emergency rate of brake pipe reduction is obtained.

At the equalizing portion, the reduction of brake pipe pressure under the piston permits the higher equalizing reservoir pressure in chamber D above the piston to move the piston to its lowest position. In this position the overcharge check valve is unseated. This permits equalizing reservoir air to flow past the open check valve into the brake pipe passages and to the atmosphere past the open emergency valve. Thus the equalizing reservoir volume is connected and vented to atmosphere during emergency application.

To color sketch 19, proceed as follows: With an orange pencil, color passage 21, the entire space above the rotary valve and passages 32 and 12. In orange dashes, color passage 14 to the exhaust passage in the rotary valve, passage 14a, and the space above and below the open maintaining valve in the equalizing portion.

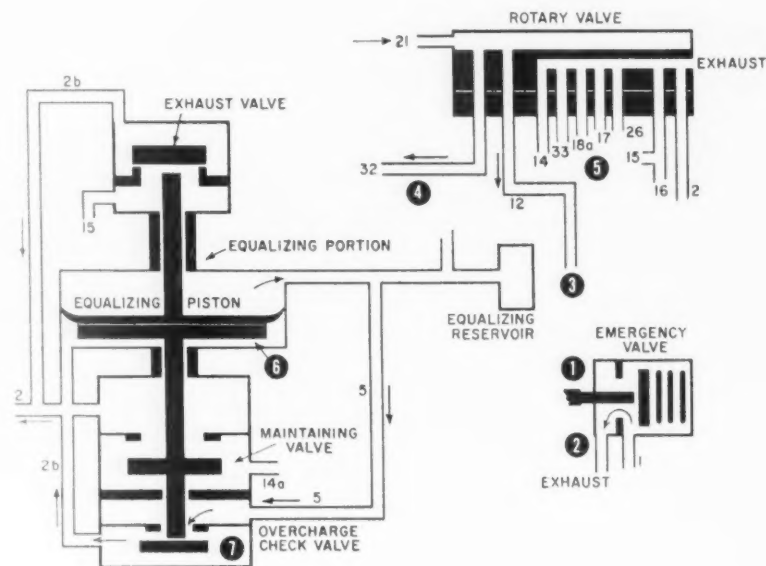
Assuming that the emergency reduction of brake pipe air has just taken place, brake pipe and equalizing reservoir pressures have not yet been depleted. The coloring should be solid, rather than in dashes. With a yellow pencil, color passage 1 and the space around the emergency valve, carrying the color

out the passage marked EX. Color the space above the exhaust (equalizing discharge) valve, passages 2b and 2, the space above the maintaining valve, under the equalizing piston, and below the overcharge check valve.

In yellow dashes, color the space below the exhaust (equalizing discharge valve) and connecting passage 15; passages 15, 16 and 2 at the rotary valve; and into the exhaust passage. Dampen and let dry. With a light green pencil, color

passage 5, chamber D above the equalizing piston, equalizing reservoir and the space over the overcharge check valve down to the yellow color below the valve. In light green dashes, color passage 18a and into the exhaust passage in the rotary valve. Dampen and let dry.

Color in gray dashes, passages 17 and 26, and into the exhaust passage in the rotary valve. Dampen and let dry. Do not color passage 33 at the rotary valve.



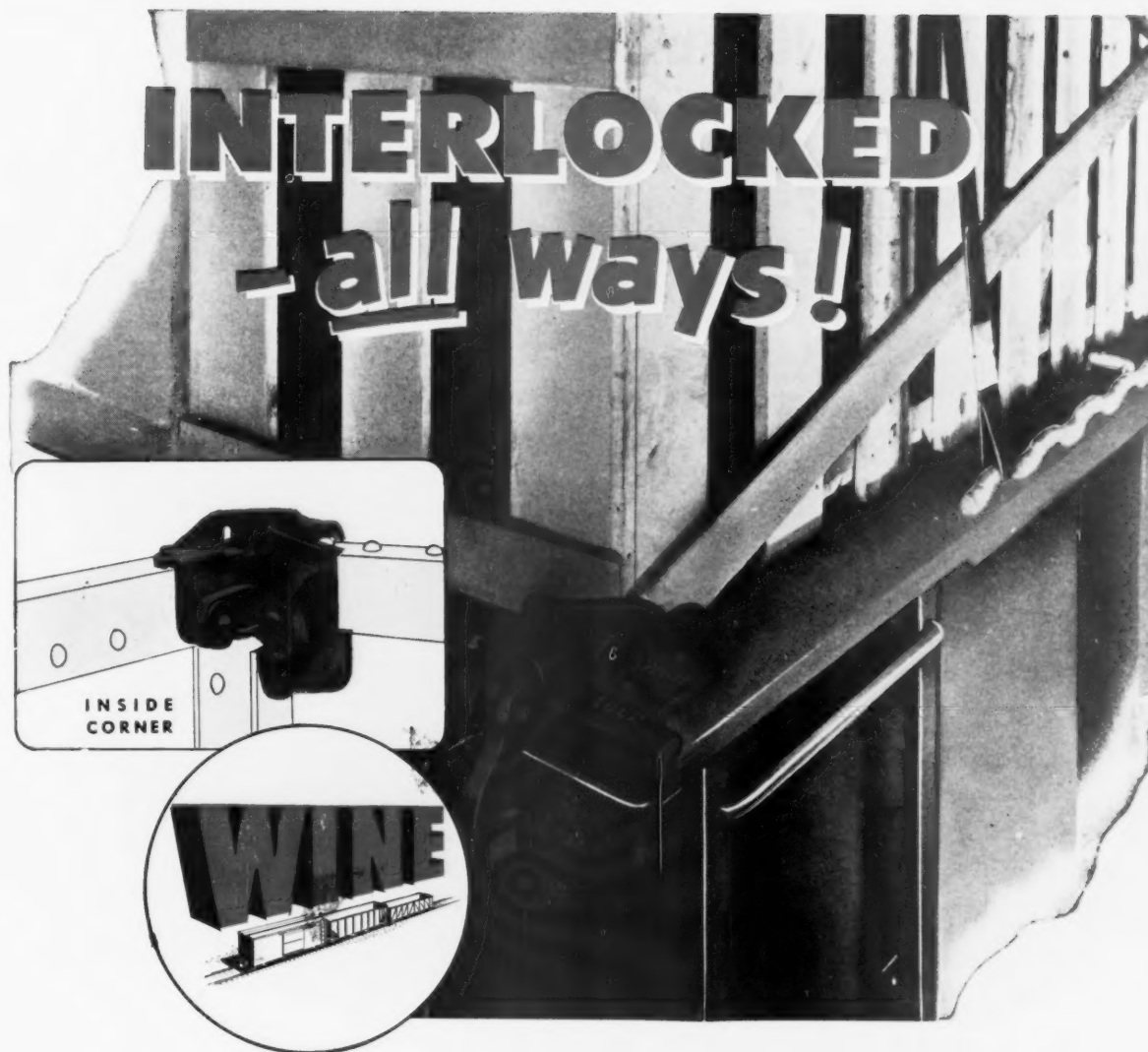
Sketch 19

### Emergency Operation

1. Brake Valve in Emergency position. Emergency Check Valve is unseated.
2. Brake pipe air flows from passage 1 to EX.
3. Feed valve pressure to passage 12 (Power Knock-Out)

4. Feed valve pressure to passage 32 and to feed valve control chamber.
5. Other passages as indicated, through rotary valve to Exhaust.
6. Higher Equalizing reservoir pressure has moved equalizing piston to its lowest position.
7. Equalizing reservoir air flows past open check valve to brake pipe.





# DROP END LOCKS

**KEEP CORNERS FROM SPREADING • WON'T ACCIDENTLY OPEN**

The Wine Drop End Lock has an unequalled record for continuous service with minimum maintenance. Progressive developments include the addition of a pry-bar opening to facilitate easier drop and closing, even when the car structure is distorted from hard service.

The 3-way interlocking feature assures positive closure and retains the end and sides in their original relative position by preventing the sides from spreading at the corners. Equipped with the Wine Drop End Balancer in combination, one man closures of the heaviest drop ends is safe, fast and economical.

**THE WINE RAILWAY APPLIANCE CO. TOLEDO 9, OHIO**

**New oil sets record in 330,000-mile**



## **GULF DIESELMOTIVE protects rated power of high-output**

The pictures tell the story. Gulf's new Dieselmotive 78 keeps engines cleaner — longer. But that's not all. *This new oil enables high-output Diesels to deliver their full rated power . . . under certain conditions, it can actually increase the tonnage ratings!*

Southern Pacific put Dieselmotive 78 through a series of grueling tests in EMD 567-C units on Southern Pacific lines in Texas and Louisiana. You know the run—from hot and humid lowlands to chilly mountain

passes . . . temperatures ranging from 110 to zero degrees. Tough hauls up steep grades . . . long runs through dust, heat and cold.

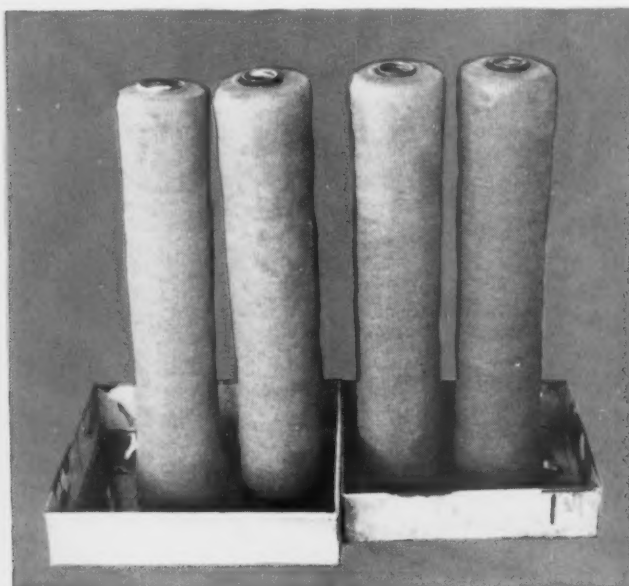
After 165,825 miles, the engines were disassembled. Rings, pistons and liners showed amazingly little wear. There were no heavy deposits or varnish anywhere. Main bearing shells were so near-new they were re-installed for further service.

You can see how engines as clean as this deliver all the power built into them. Com-

test...



After 165,825 test miles on Dieselmotive 78, pistons and liners when removed looked like this. All parts were clean, free of deposits and showed negligible wear.

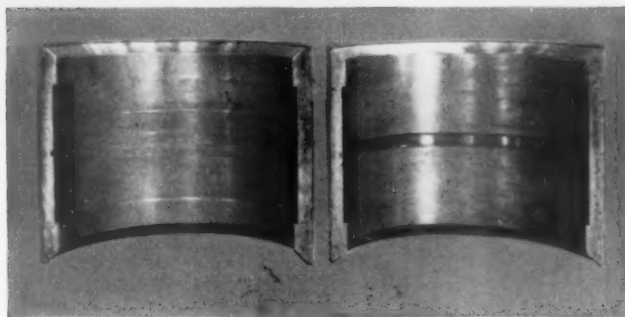


Filters are free of heavy sludge. Dieselmotive 78 has about twice as much additive as ordinary Diesel engine oils. This additive reserve insures cleaner engines, less wear, than ever before.

## 78 OIL engines

pression is maintained, insuring continued high engine efficiency.

Gulf Dieselmotive 78 is now being demonstrated on the Missouri Pacific and Seaboard Airline Railroads. Why don't you try this new and better oil? Merely contact the Gulf engineer at your nearest Gulf office for any help you need. Or, write for more data.

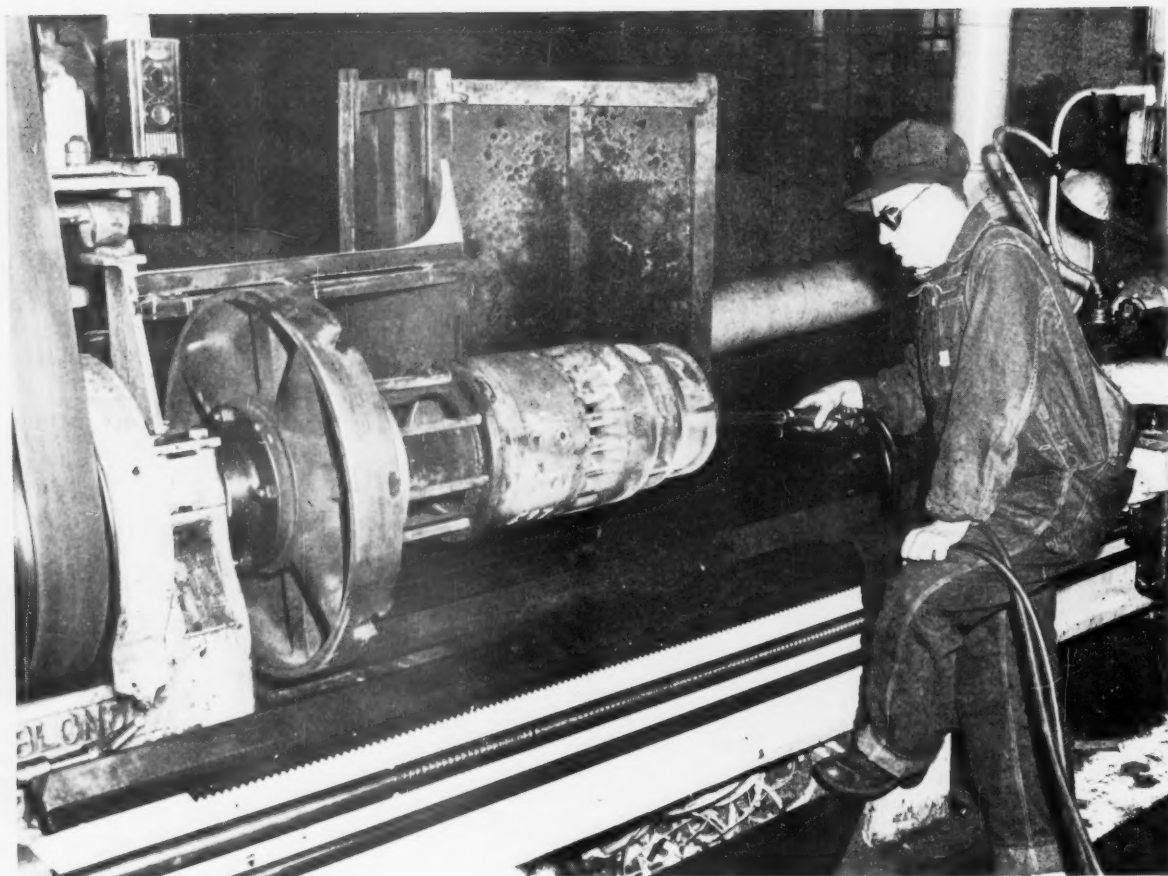


Note clean appearance of connecting rod bearings immediately after removal from engines. Gulf Dieselmotive 78 retains its stability and lubricity even when subjected to high temperatures for extended periods.

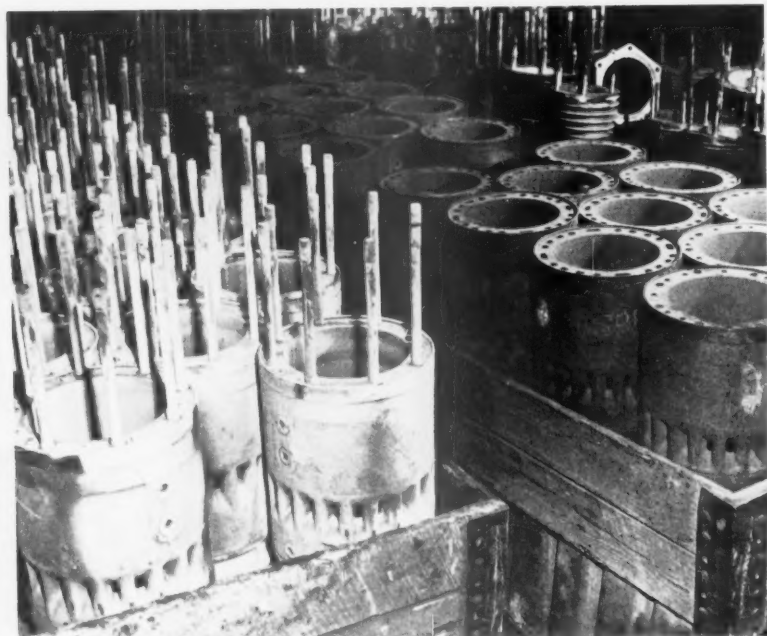
**GULF OIL CORPORATION**

Dept. DM, Gulf Building, Pittsburgh 19, Pa.





Cylinder liner gets preheated before application of metal spray.



Cylinder liners with and without studs after cleaning process and ready for metallizing.

(Continued from page 36)

railroad. According to company sources, from 300 to 500 liners were scrapped each year. Before the installation of the Metco equipment, a method of reboring twice was used to salvage the liners. After the second reboring, the liners were scrapped after reaching limit of wear. Now the liners are rebored two step sizes and then reclaimed by metal spraying, eliminating the purchase of new liners and costing about one-half that of a new liner.

Shop procedure in preparing the liners for the metal spray consists of cleaning, boring and placing in furnace for degreasing. The liner is then pre-heated, starting at 300 deg F and the metal spray builds up to 400-450 deg F during the operation. The wire used is Spra-Bond and Spra-Steel #25, both  $\frac{1}{8}$  in. in diameter. Thickness of coating applied is 0.065 in. with the thickness of metal machined in preparation



**LOW COST MODERNIZATION  
FOR CARS OF ALL CAPACITIES..**



**NEW**

**CR**

(Cushion-Ride)

**PACKAGE UNIT**

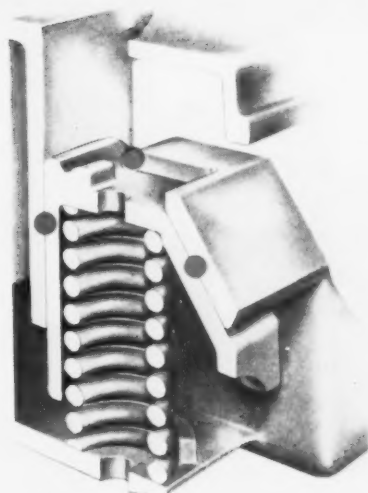
Applicable to *all* previously built, non-friction control trucks. Available with 2-1/2" or 3-1/16" spring travel.

**ENGINEERED and BUILT BY**

**Buckeye**

FOR COMPLETE INFORMATION..CALL OR WRITE  
*Refer Adv. 11882*

*Ask for Bulletin No 204*



CUTAWAY OF THE BUCKEYE C-R PACKAGE UNIT SHOWING THE FEATURED MAXIMUM FRICTION BEARING SURFACES.





Workman adjusts spray gun before metallizing piston.

for spraying being 0.020 in. Time required for the complete process is approximately four hours.

Wrist pin reclamation has been a profitable operation. An engine set of sixteen is handled as a unit to fit

in with the shopping program.

When the pin reaches limit of wear, it is cleaned in the Aja-Dip cleaning tank, and checked by Magnaglo for fractures. The pin is then mounted on an expansion

mandrel in a Landis grinder and ground dry 0.010 in. undersize to allow coating of about 0.005 in. after finish grinding. Spra-Bond is then applied. A simple mounting fixture holds the spray gun in proper position on a lathe, giving rapid, even deposit of metal. The pin is then wet-ground to finish size.

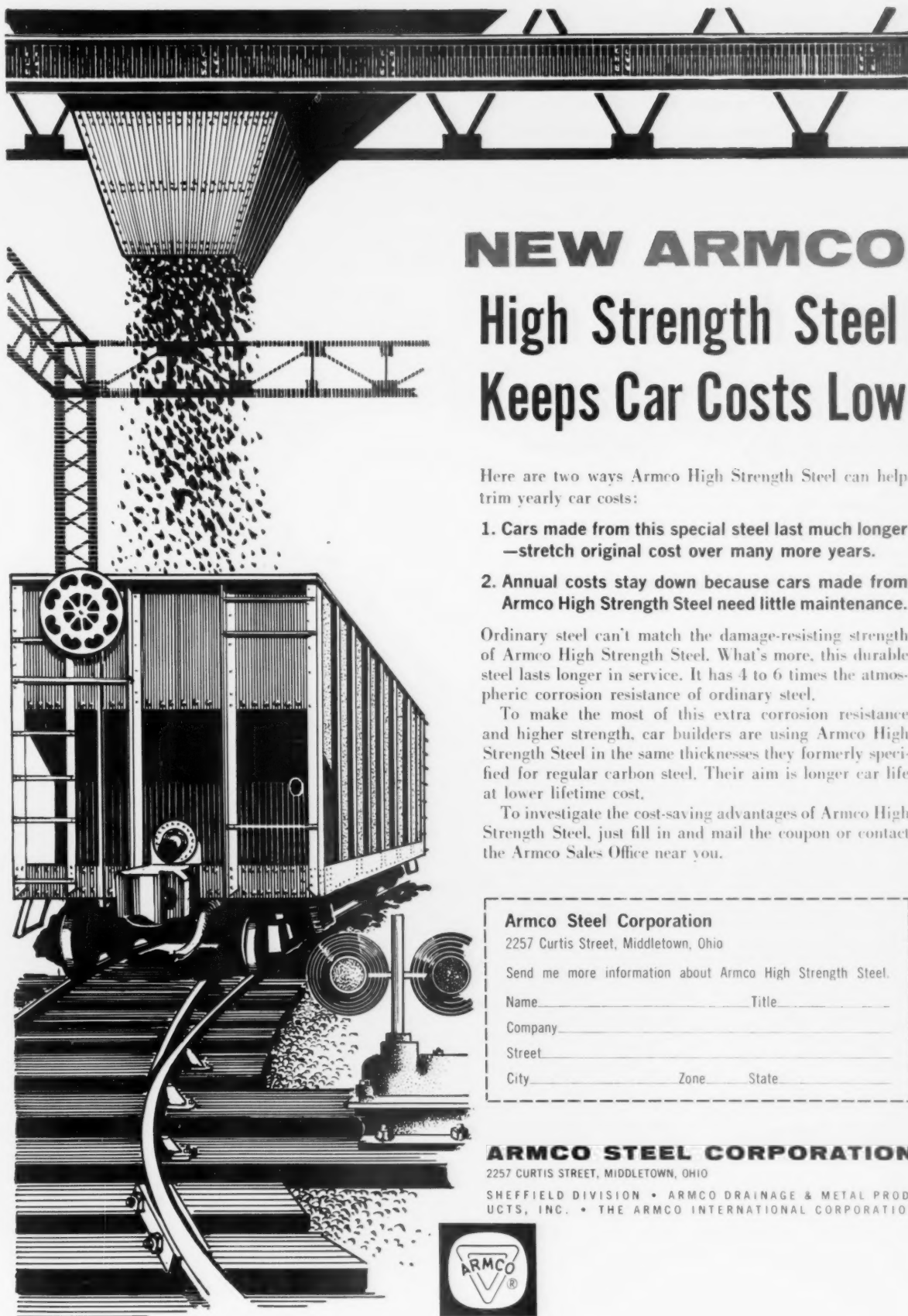
This operation, like the other parts metal sprayed, requires only one man to prepare and operate the equipment. The cost of reclamation including labor and material is about \$6.50 per pin. Approximately six hundred pins each year are salvaged.

Additional items metallized include Woodward governor drive shafts, armature shafts, and various pieces of equipment used in operation of the maintenance shop. Down-time, due to lack of available replacements in company machines, or delay in obtaining same, has largely been eliminated by metallizing many worn parts which were formerly scrapped.

The Metco equipment consists of a 4E gun, a Y gun, Spra-Steel 25 wire, Spra-Babbitt A wire  $\frac{1}{8}$  in. in diameter, reel, Spra-Bond wire, a wire straightener, flowmeter, and dehydrator to remove moisture from the air.



Wrist pins before and after reclamation.



## NEW ARMCO High Strength Steel Keeps Car Costs Low

Here are two ways Armco High Strength Steel can help trim yearly car costs:

1. Cars made from this special steel last much longer —stretch original cost over many more years.
2. Annual costs stay down because cars made from Armco High Strength Steel need little maintenance.

Ordinary steel can't match the damage-resisting strength of Armco High Strength Steel. What's more, this durable steel lasts longer in service. It has 4 to 6 times the atmospheric corrosion resistance of ordinary steel.

To make the most of this extra corrosion resistance and higher strength, car builders are using Armco High Strength Steel in the same thicknesses they formerly specified for regular carbon steel. Their aim is longer car life at lower lifetime cost.

To investigate the cost-saving advantages of Armco High Strength Steel, just fill in and mail the coupon or contact the Armco Sales Office near you.

### Armco Steel Corporation

2257 Curtis Street, Middletown, Ohio

Send me more information about Armco High Strength Steel.

Name \_\_\_\_\_ Title \_\_\_\_\_

Company \_\_\_\_\_

Street \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

### ARMCO STEEL CORPORATION

2257 CURTIS STREET, MIDDLETOWN, OHIO

SHEFFIELD DIVISION • ARMCO DRAINAGE & METAL PRODUCTS, INC. • THE ARMCO INTERNATIONAL CORPORATION



# CLEVITE

## MAKES IT!

### World's Largest, Most Experienced Independent Manufacturer of Sleeve-Type Bearings (One Million Bearings per Day)

It took a rare combination to create the Clevite Sealed Sleeve Bearing Cartridge. Cooperation and operating experience of railroaders plus concentration of the vast Clevite experience, research and laboratory facilities and manufacturing processes that produce millions of bearings for industry and military forces. The results—a change-over journal bearing that is built to exceed AAR requirements for “hot box” elimination and meets the high quality-with-economy standards of Cleveland Graphite Bronze Company Division of Clevite Corporation, Cleveland 10, Ohio.

### Largest Supplier of Stabilized Trucks

*(Over 450,000 car sets of  
Barber Stabilized Trucks Sold)*

What's more, you'll get the hard-earned railroading experience, engineering skill and continuing maintenance follow-up that have made Barber a trusted name

# STANDARD CAR TRUCK COMPANY

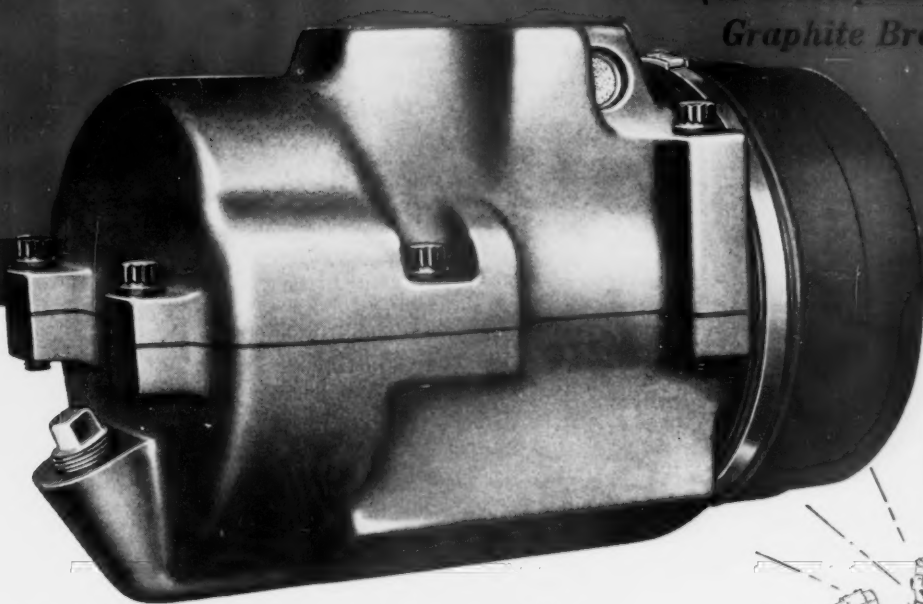
### DISTRIBUTES IT!

wherever freight cars roll. You'll deal with representatives who know your requirements and how to meet them economically to lick the “hot box” headache.



# ...announces **THE HIGH PERFORMING, ECONOMICAL CHANGE-OVER JOURNAL BEARING** FOR AMERICA'S TWO MILLION FREIGHT CARS

*(A development of Cleveland  
Graphite Bronze Company)*



## **YOU SAW IT DEMONSTRATED AT CHICAGO**

...It's the answer to railroads' *hottest* problem! Simple to install—requires less modification, so it's more economical. And when installed, it's a permanent and soundly engineered conversion. Tested by the AAR and approved for limited application in interchange service.



# **CLEVITE**

**SEALED SLEEVE  
BEARING CARTRIDGE**

Write or Phone Distributor: Standard Car Truck Co., 332 S. Michigan Ave., Chicago 4, Ill.  
(In Canada: Consolidated Equipment Co., Ltd., Montreal 2)



"Windy Monster", one of eight vacuum-cleaner trucks in use on Canadian National at Montreal, has brought dry cleaning time down to 15 minutes. Dry fines are piped into cans on the truck body for easy disposal. High and hard-to-reach corners of CNR box cars are cleaned with long nozzles which two-man crews use. Vacuum suction removes refuse from inaccessible corners and cracks which sweeping would never loosen.

## CNR Cleans Them Fast

Mechanization has come to car cleaning on the Canadian National, and the result is faster, more thorough cleaning and reduced labor costs. CNR's Turcot car cleaning yard is situated on the north side of Turcot West Yard in Montreal and holds about 270 cars. Its six tracks have a combined length of 14,000 ft. On each side of each track are roadways for truck movement. Tracks 3 and 4 which pass through a concrete block decontamination building handle four cars.

Cleaning of the cars is broken down into three operations—removal of dunnage, removal of dry fines, and wet cleaning.

For dunnage removal, there are two specially designed trucks. The rear platform of each truck is raised to the level of box car floors and mounted there are two one-cubic-yard "Convento" dump units. The dump units are raised hydraulically. To illuminate box car interiors, each truck is equipped with special 120-v lighting apparatus.

Vacuum cleaning is used for removal of dry fines from box cars, and for this there are eight special trucks. Each has been equipped with a vacuum cleaner; a belt-driven centrifugal exhaust; a 12-cu ft secondary dust separator; and six drums with special lids that form the primary separators. Each truck has two 50-ft lengths of 2-in. vacuum hose. Two trucks are equipped for wet cleaning box car interiors. Each cleaning truck is operated by a two-man gang. Both men perform cleaning work, but one man is responsible for operating the truck and power equipment on it.

### Systematic Cleaning

The cleaning operation of the equipment begins after the car has been spotted on the cleaning track. The dunnage truck drives up and its gang opens the doors and cleans out the dunnage—blocking, steel strapping, boards and nails. The vacuum truck follows behind and

is spotted at the box car door. The two men enter the car each with a vacuum hose and each vacuums half of the car. If necessary, walls and ceilings are vacuumed.

Inspectors follow and decide whether wet cleaning is necessary. If not, they tag the car as ready for service. In the summer, wet cleaning is done outdoors. During the winter, cars marked for wet cleaning are moved into the decontamination building.

The cleaning yard organization consists of an outside foreman who reports directly to the divisional superintendent, two leading hands who supervise the men engaged in cleaning, and a mechanic who is responsible for the servicing and maintenance of the trucks.

The equipment was developed by CNR engineers working with R. C. Chown, Inc., of Montreal. After tests of all of the new equipment, it is expected that similar trucks will be purchased for use in CNR freight yards all across Canada.



## General Electric Locomotive Cables— wherever environment is a problem

Sand and dust storms, pebbles that fly and cut like bullets, scalding steam, an occasional oil bath or a dousing with detergents or other corrosive cleaning compounds—these are the environmental problems you face with locomotive cables. And as long as the unit is operating, there's motion that causes either simple vibration or severe and constant flexing. You need a cable designed to take this treatment and still deliver economical service life. General Electric Versatol\* Geoprene\* locomotive cables are designed to meet your toughest service conditions.

\*Registered Trade-mark General Electric Company

These cables are dependable in over-load conditions, too. When steep grades and heavy hauls cause copper temperatures to rise, the insulation of the Versatol Geoprene cable will carry the load without deteriorating.

G-E locomotive cables are available in a variety of types for all applications (even extreme temperature) right from conveniently located warehouse stocks. For more information, write Section W213-1147, Wire and Cable Department, General Electric Company, Bridgeport 2, Connecticut.

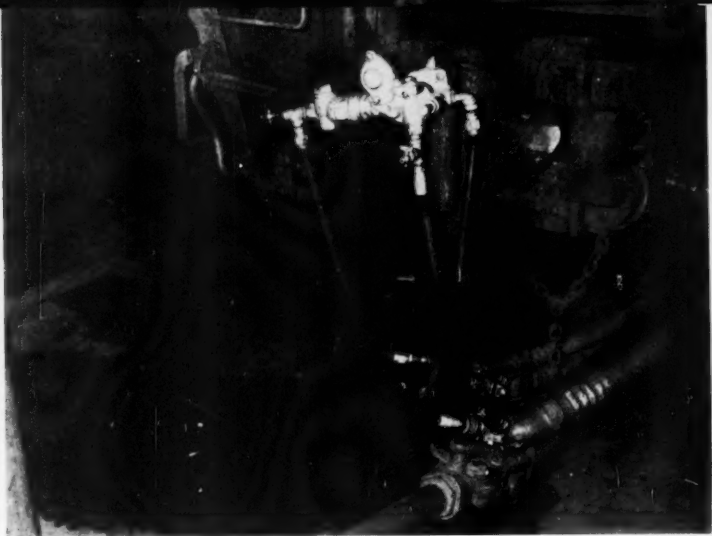
*Progress Is Our Most Important Product*

**GENERAL  ELECTRIC**



# UP Saves Time Testing 'Streamliner' Brakes

Test device for brake system is suspended from the tight-lock coupler of one of the UP's light-weight coaches while in use.



A special test rack and angle cock-testing device, developed at Albina, Ore., shops of the Union Pacific and subsequently used at other points on the system, gives a unique method for testing the air brakes of passenger trains. The testing job is simplified, labor costs reduced, and 15 to 20 min saved with a nine-car train—an important advantage when turn-around time is limited.

The equipment consists of a fixed test rack housed in a booth set between the tracks in one end of the "Streamliner" shed—or shop, and an angle-cock testing device applied at the other end of the train. The sheet metal booth has a door and large windows to give good visibility down the length of the train and is well-lighted for night operation.

The test rack is equipped with electro-pneumatic and automatic air brake control valves along with all necessary pressure-release valves, gages, lights and a clock required in testing the air brake and signal equipment on up-to-date trains. The two main control valves are mounted on a narrow shelf in front of the operator's position and the rest of the equipment on a back board within easy reach and view of the operator. All electric and air connections are neatly made on the back of the instrument panel. Arrangement is made for easy connection of air and electric lines from the test rack to one end of the train.

The cock testing device is made from an old signal valve with the pop-off plug and electro-magnet removed and other fittings added to give three hose pipe connections: (right) to the electric-actuated straight-air trainline; (center) to the main trainline; (left) to the

signal air line. The cock tester is supported from the coupler and the three hoses, made of armored decelostat hose, extend downward about 3 ft for connection to the train air and signal lines.

The procedure followed in making an inbound train brake test with this equipment is as follows: Moisture is blown out of the air supply line and air hoses and electric cable are connected from the test rack to the cars. The cock-testing device is connected to the air hose glad hands at the rear of the train. The train line, signal line, and straight air line cocks to device are then opened.

**Automatic Test:** With all cocks closed on the test rack panel, the straight air brake valve handle is placed in position No. 6 and the automatic brake valve handle in running position. The train line, straight air pipe, control pipe, and signal line cocks are opened, fully charging the train to 110 psi. To determine if the train is charged, the brake valve is moved to lap position for 5 seconds during which time the brake pipe gage pressure should not drop.

With the brake equipment fully charged, a 6 psi brake pipe reduction is made by moving the automatic brake valve handle to service position, then moving the handle to lap position. After 5 minutes, an inspector walks along the train closing straight air cocks between each car and checking to see that all cars have brakes applied and automatic slack adjusters are operative.

When the release signal is given, the automatic brake valve handle is moved to running position and the brakes inspected to see that all have been released.

**Electric-Pneumatic Test:** With each car's straight air isolated and all

connectors properly in place through the train, the test rack generator is switched on, the control switch placed in manual position and the reading noted on the ammeter gage which should register about 3 amp. If the reading is below 3 amp., the circuit through the train is not complete. If the ammeter gage reading is correct, the switch is moved to M.C. position, the straight air brake valve handle placed in No. 2 position until 30 psi pressure is shown on the SA gage. The straight air brake valve handle is moved to No. 3 (lap) position and the opposite side of the train is inspected to see that all brakes have applied. When the release signal is given, the straight air valve handle is moved to No. 6 position and all straight air cocks opened on the release walk.

**Cock Test:** This test can be made only when the device is connected to the rear of the train. After the release signal is received and the brakes released, the signal line cock on the panel is closed, all other cocks being open. While the electric release walk is being made and straight air cocks between cars opened, the signal line pressure is drained by opening the signal exhaust cock on the panel. The exhaust cock is then closed. Before conductor valves on the car are tested, the switch is placed in manual position. With the generator running and the red light on (indicating release circuit through the train is energized), the straight air pressure is increased to 70 psi.

Signal line pressure should not increase until the train line pressure is reduced to 50 psi or less, either by use of the conductor's valve in the car or the automatic brake valve on the test rack.

When train line air pressure is



# USG<sup>®</sup> BRUSHES AY32 AND 2306 ARE THREE WAYS BETTER



## LOW COMMUTATOR MAINTENANCE

Because of their long life and reduction of copper drag which minimizes flashovers, USG Brushes AY 32 and 2306 have proven convincingly that they reduce the maintenance cost on Diesel-Electric locomotive generators.

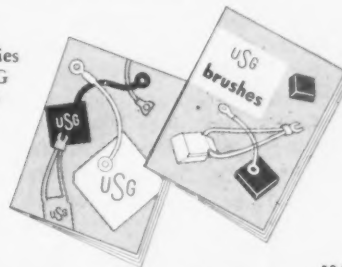
## LONGER LIFE—MINIMUM WEAR

Primarily because of their purity and density, USG Brushes operate perfectly for substantially longer periods of time than the average type brush. Naturally, this means reduction in delays due to brush replacement.

## PERMANENT SHUNT CONNECTION

In recent years nearly every reputable brush manufacturer has improved the anchorage of the shunt connections: none, however, are quite as firm or quite as permanent as the method employed on USG Brushes, called STATITE<sup>®</sup>. The shunt can't be jerked out and, of course, it does not jar loose.

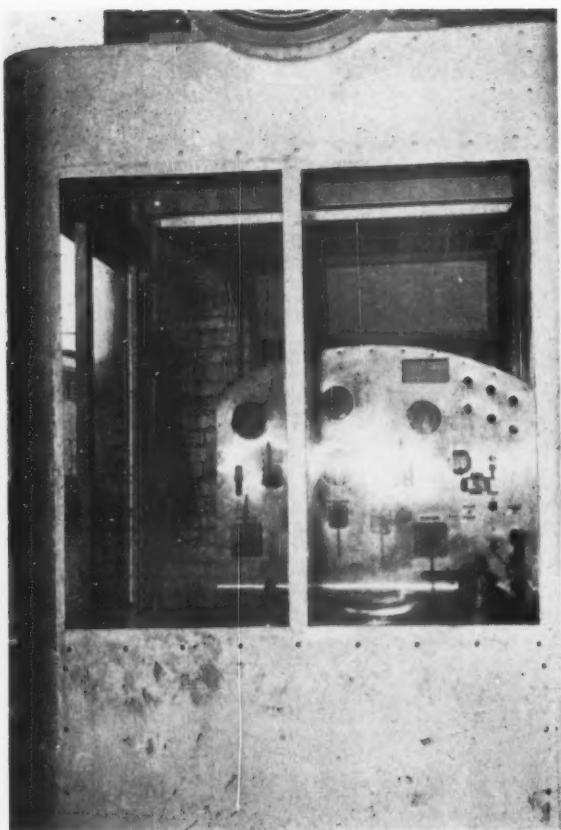
Write for your copies of the latest USG Brush Catalog B-56 and the new USG Brush Grade Supplement.



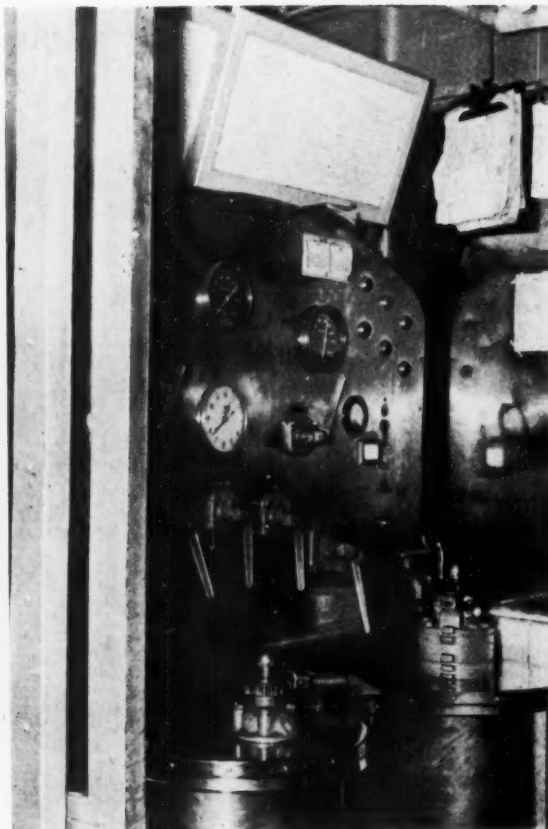
B247-1

## THE UNITED STATES GRAPHITE COMPANY

DIVISION OF THE WICKES CORPORATION, SAGINAW 13, MICHIGAN  
GRAPHITAR<sup>®</sup> CARBON-GRAPHITE • GRAMIX<sup>®</sup> SINTERED METAL PARTS • MEXICAN<sup>®</sup> GRAPHITE PRODUCTS • USG<sup>®</sup> BRUSHES



Test cabin is located adjacent to the coach yard tracks at Portland and air tests are made while other work is being done.



Control panel enables test to duplicate all of the locomotive control functions and to make several additional tests.

about 20 psi below straight air line pressure, signal line pressure should start to increase, indicating that all cocks through the train are open. If the signal line pressure fails to rise, this shows that a train line, signal line or straight air line cock is closed.

**Leakage Test:** After the cock test is made, the generator is switched off and the automatic brake valve handle placed in running position, straight air valve handle in position No. 6, the signal line cock opened and the SA by-pass cock on the rack panel closed.

With the train fully charged, a 15 psi brake-pipe reduction is made by moving the automatic brake valve handle to service position, and then to lap position. The train line cock is closed and brake pipe pressure checked on the gage. If leakage does not exceed 5 psi in one minute, the brake valve handle is moved to running position and the train line cock opened.

The next operation is to turn on the generator, move the control

switch to manual position, press the green button (application), and charge straight air line pressure up to 30 psi. The straight air line cock on panel is closed and the SA line pressure watched for one minute. Leakage must not exceed 5 psi. With the test completed, the SA line cock is opened.

The signal line cock is closed and leakage watched for one minute. Leakage must not exceed 3 psi. The signal line cock is opened.

**Slow Release Test:** With the regular inbound and leakage test completed, the equipment is fully charged and the slow release cock on panel opened. With the brake valve in service position, a 15-lb brake pipe reduction is made, the brake valve returned to lap position, the train line cock closed after 30 sec, and the brake valve placed in running position. Brake pipe pressure on the gage is noted and, after an increase of approximately 5 psi, all brakes should be released. Brakes that do not release indicate a defective control valve which

must be corrected. After the signal is received, indicating that the inspection has been completed, the train line cock is opened and equipment fully recharged.

#### **Brake Cylinder Maintaining Test:**

The brake valve is moved to service position, a 15 psi brake pipe reduction made and the brake valve handle returned to lap position. After 30 sec the train line and slow release cocks on the rack panel are closed and the brake valve immediately moved to running position. A check is made through the train to see if brake cylinder pressure on each car is uniform; also that signal valves are operative, and retainer and conductor valve handles in order.

Any irregularities found on this inspection are corrected. After inspection is complete, train line and slow release cocks are opened.

**Outbound Test:** This test is made the same as the inbound test with the exception that straight air cocks between the cars are not closed on the walking inspection.

Bar-burned traction motors a problem?

Call your **N**ATIONAL brush man...



Here's how he helped one road slash reconditioning costs!



MURPH VARNEY

At least 70 traction motors a year — laid up because of premature commutator bar burning. That was the problem "National" Carbon Brush Man Murph Varney found on a leading mid-west road. Amazingly, the road felt that resulting down time, parts and labor costs were the unavoidable price of high speed passenger operation.

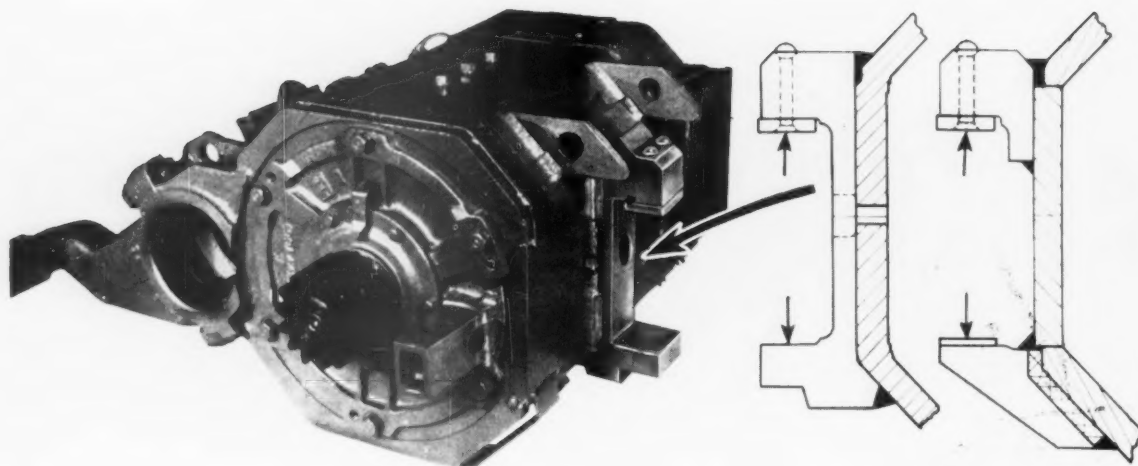
Murph proved differently by analyzing this road's problem and recommending the right "National" car-

bon brush to alleviate bar burning. Result: premature removal of traction motors fell from 70 to 5 a year. Murph Varney and his fellow "National" Carbon Brush Men have been solving railroad brush problems for years. Their experience and training — backed by "National" long term brush development — make them the logical consultants on any railroad brush application. Call them today or write National Carbon Company, Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, N. Y.

The terms "National", "N" and Shield Device, and "Union Carbide" are registered trade-marks of Union Carbide Corporation  
NATIONAL CARBON COMPANY • Division of Union Carbide Corporation • 30 East 42nd Street, New York 17, N. Y.  
Sales Offices: Atlanta, Chicago, Dallas, Kansas City, Los Angeles, New York, Pittsburgh, San Francisco. In Canada: Union Carbide Canada Limited, Toronto



# ELECTRICAL SECTION



The type 362 motor with original nose design.

The old and new nose design.

## Old Locomotives Can Be Made Better Than When New

When electrical and mechanical parts of diesel locomotives are overhauled they can incorporate improvements made available by the manufacturer

By R. L. Borgardus and  
T. H. Murphy

SOME 10,000 OR MORE locomotives have now reached a stage in which their equipment should be placed in a condition as good or better than it was when new, so as to successfully operate for the next period of service.

The manufacturers' repair shops have been performing overhaul work on a production basis simultaneously with repair work necessi-

tated through breakdowns. Such repair work has presented the opportunity of studying ways and means of motor and generator improvement. There are improvements now developed that, if included at time of overhaul, will give longer trouble-free life than was contained in the original equipment. Also, new improvements can be developed by the repair shops if the problems or troubles experienced by the railroads with a particular piece of equipment are outlined to them. Close cooperation between the railroad and shop is necessary as all improvements should be thoroughly road tested.

Ordinary procedures permit the repair shop to bring the equipment

back to its original design condition. Extreme care must be exercised to avoid unnecessary changes during overhaul that deviate from the original design. However, where weaknesses are noted, every effort should be made after careful study to effect improvement. Experience has proven that any rehabilitation program that does not take advantage of up-to-date mechanical electrical progress to overcome adverse conditions would, in the long run, defeat itself.

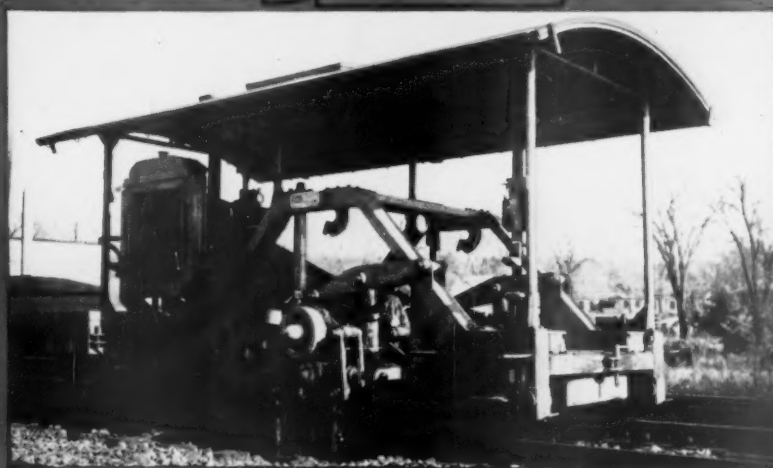
### Shop Inspection

The first step in rehabilitating motors and generators should be a  
(continued on page 58)

This is an abstract of a paper presented at the Summer General Meeting of the American Institute of Electrical Engineers, at Montreal, Que., Can., on July 24-28, 1957. Both authors are with the Westinghouse Electric Corporation, Pittsburgh, Pa.



# NEW ESSOLUBE HD KEEPS ENGINES CLEANER LONGER... INCREASES POWER, REDUCES WEAR



New Essolube HD is a superior lubricating oil developed for gasoline and diesel engines of the types used in maintenance-of-way equipment. New Essolube HD contains one of the most effective detergent inhibitor additives ever used. It offers new low-temperature detergency and improved high-temperature detergency, plus improved oxidation stability and bearing corrosion resistance.

In extensive laboratory and field tests prior to its introduction, new Essolube HD *proved* its superior detergency properties. Under low-temperature conditions, Essolube HD markedly reduced sludge deposits. Under high-temperature conditions, piston varnish and top ring deposits were reduced to a new low. Such outstanding engine cleanliness results in *greater engine power, reduced wear, longer life.*

**NEW ESSOLUBE HD** is a versatile oil. You will save on inventory and handling by using it in all your maintenance-of-way equipment — both diesel and gasoline. But most important... there's no danger of using the *wrong* lubricant by mistake.

If you would like more specifics on new Essolube HD, call your local Esso office or write to Esso Standard Oil Company, Railroad Sales Div., 15 West 51st St., New York 19, N. Y.



RAILROAD PRODUCTS



# YOU TOO CAN SAVE MONEY WITH... *Lewis* **sealtite** RAILROAD FASTENERS

## "ZINC BOLTS CUT COSTS"

We are hearing it more and more, "Zinc bolts save money." More railroads are using Sealite Double-Life, Hot-Dipped, Sealed in Zinc, galvanized bolts. They add years of life, cut costs by retarding rust and corrosion. Ask about them.

SEALTITE  
TIMBER BOLT

More than 85 per cent of the nation's No. 1 railroads use Lewis Sealite products—because the extra features save them money.

Each Sealite bolt and nut is precision designed to do its particular job better. Every Sealite product is hot forged from uniform special quality steel.

All Sealite products are made in the USA to meet or exceed ASTM specifications.

A FEW OF THE MANY  
RAILROADS USING  
SEALTITE PRODUCTS



## OTHER FEATURES THAT SAVE YOU MONEY

### FLUSH WITH SURFACE

Sealtite pulls up to a "level with surface" fit without counter sinking.

### PERFECT FIT

Shank diameter thread to head is exact. No air pockets, no corrosion.

### NO SPLINTERS

Sealtite scientific design compresses without raising surface splinters.

### PATENTED FINS

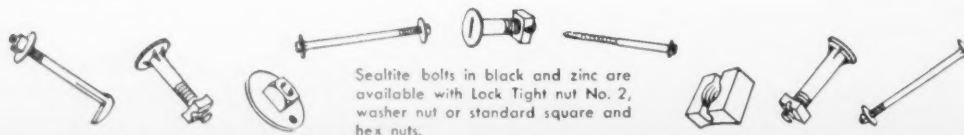
For full bearing strength without tearing or splitting wood.

### MOISTURE TIGHT

Sealtite tapered, beveled edge forms perfect water tight seal.

### ACCURATE THREADING

A spinning fit on each bolt offers easy, fast installation.



Sealtite bolts in black and zinc are available with Lock Tight nut No. 2, washer nut or standard square and hex nuts.

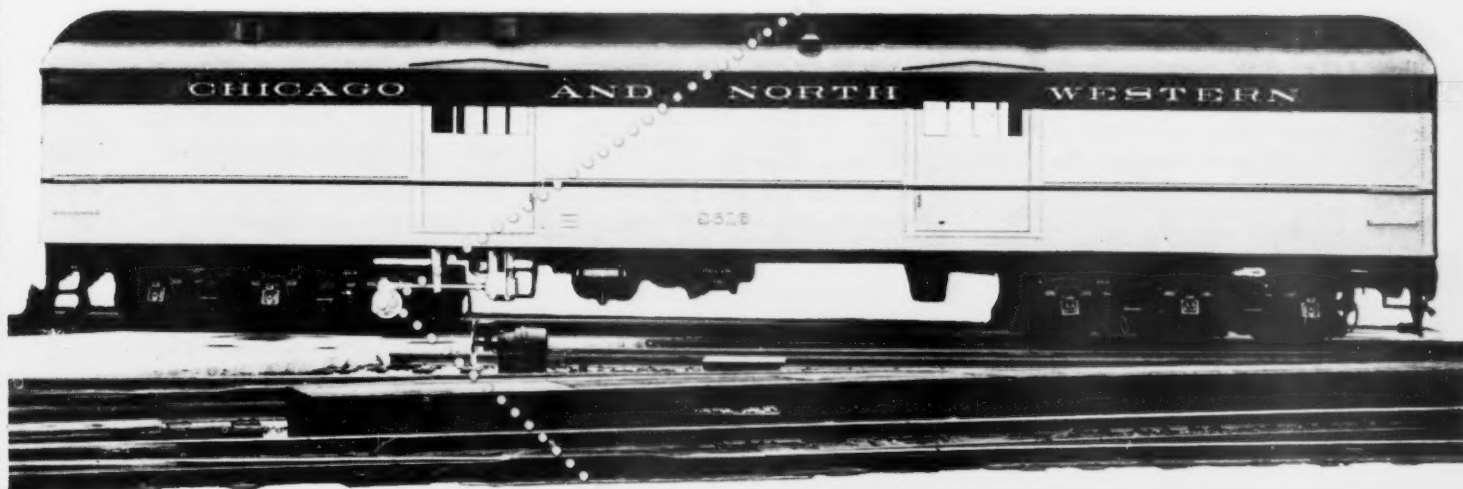
*Lewis* **BOLT & NUT COMPANY**  
504 Malcolm Avenue S. E. • Minneapolis 14, Minnesota



**Chicago and Northwestern uses  
the Spicer Model 2½ to 5KW**



**POSITIVE GENERATOR DRIVE**



**... the smallest, lightest  
and lowest-priced positive  
drive for railway generators!**

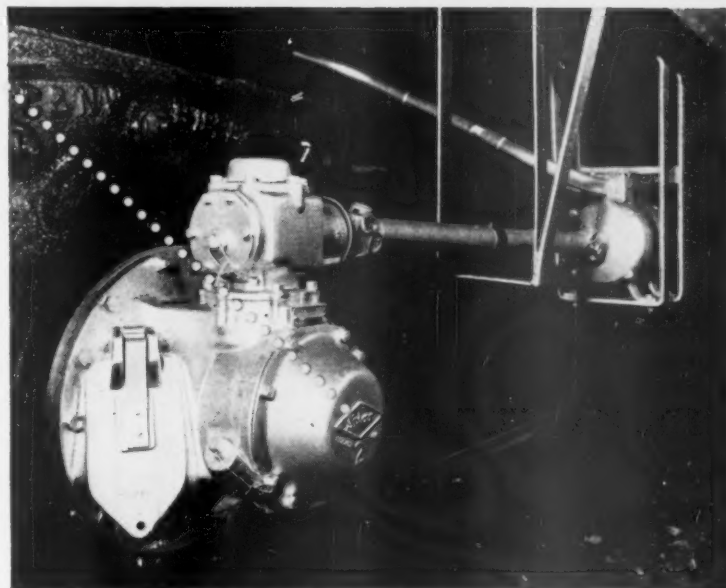
The Model 2 and Model 2-1 Spicer End-of-Axle Drives have been developed for generators up to 5 KW capacity on caboose, cabin, mail, baggage and refrigerator cars.

These drives can be installed either horizontally or vertically, especially meeting the requirements of cabooses and head end cars where minimum maintenance and low operating costs are imperative.

The Model 2 is used on all axles with friction bearings, and on roller bearings where it is not permissible to go through the bearing end cap. It is available for all horizontal and vertical applications in ratios of 1.76 to 1; 2.47 to 1; 3.70 to 1; 5.28 to 1; and 7.55 to 1 (this ratio not available for vertical application).

Model 2-1 is used on roller bearing axles where it is permissible to go through the bearing end cap. It is available in ratios of 1.76 to 1; 2.47 to 1; 3.70 to 1; and 5.28 to 1. Both models are self-contained units employing spiral bevel gears with all wearing parts running in a constant bath of oil.

Ask Dana engineers to help adapt the Spicer Generator Drive to your particular new and old car requirements.



Spicer Generator Drives and Spicer Drives are in use on over 14,000 cars for over 80 railways.



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**DANA PRODUCTS Serve Many Fields:**

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**INDUSTRIAL VEHICLES AND EQUIPMENT:** Transmissions, Universal Joints, Propeller Shafts, Axles, Gear Boxes, Clutches, Forgings, Stampings.

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**AGRICULTURE:** Universal Joints, Propeller Shafts, Axles, Power Take-Offs, Power Take-Off Joints, Clutches, Forgings, Stampings.

**MARINE:** Universal Joints, Propeller Shafts, Gear Boxes, Forgings, Stampings.

*Many of these products manufactured in Canada by Hayes Steel Products Limited, Merrilton, Ontario*

complete inspection and test of their mechanical and electrical components. A good inspection will determine not only the parts that have failed and must be replaced, but also those worn parts that will not run to the next overhaul period, or which experience indicates should be replaced. Any wholesale replacement of parts without proof of the necessity of change results in excessive costs.

In testing the equipment, a thorough knowledge of the operating conditions is of importance, together with an understanding of the original design and construction of the unit. The initial examination should include a thorough cleaning of all parts followed by a visual inspection and electrical testing of the several parts. Special studies have been and are being made by various persons and companies of cleaning and testing motors and generators.

Field coil ground insulation should be visually inspected for oil and moisture penetration, progressive aging, mechanical damage, excessive temperature damage and any indication of leakage. Experience has proven that if a ground failure or a turn to turn failure develops in one field of a motor, all fields should be removed and tested. Tests for turn to turn faults are made by impressing a high frequency voltage across coil terminals.

#### Armature Inspection

Visual inspection of the armature winding to detect charred wedges, loose wedges, armature coil move-

ment at slot edges or coil supports, oil and moisture penetration, progressive aging, mechanical damage, excessive temperature, arcing at points behind commutator or between coil ends should be performed on receipt of the equipment. Careful examination should be made of the commutator end to detect any flaking of mica from the front V ring, flowing of solder at coil and commutator connections, and loose or damaged armature bands. Inspection of the solder on the bands should be made before any electrical testing is considered. All armature inspections should be based on the important fact that an armature winding must be a sound mechanical and electrical component without evidence of movement of coils or bands which would tend to damage insulation mechanically. Commutator rehabilitation is a major item not covered by this paper.

A turn to turn armature test will detect weakness in any of the coils and, of course, a ground test should show up points where the insulation has developed weak spots. The visual inspection is just as important as the electrical inspection, as insulation that is mechanically weak will not give expected service life.

The conventional motor frame has many places where troubles may show up after long mileage. Bearing fits become worn, welds age, fatigue areas develop cracks, and heavily loaded zones break. A frequent case of failure for motors has been the lower nose. Severe stresses

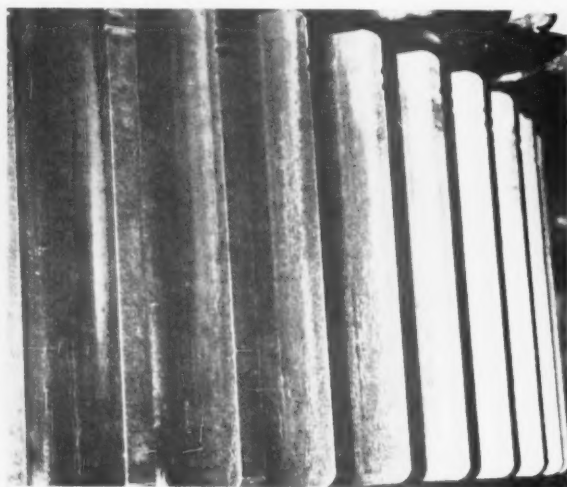
are set up when the frame passes over objects between the rails which will actually shear off the lower nose. The same is true when clearance develops in the nose supporting structure, permitting the motor to slap up and down a small amount, such as 1/4 in.

#### New Lower Nose Design

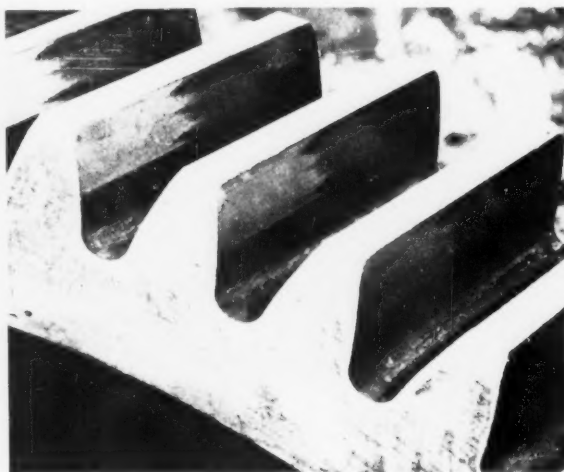
All diesel locomotive traction motors are supported by a conventional spring plank assembly carried by lugs integral with the truck bolster. The motors have an upper and lower nose resting on the top and bottom plank. The steel plates or planks are spaced by coil springs of sufficient strength to carry the motor weight and motor torque reaction forces without going solid. The motors are thus spring supported at their nose support. The nose support must be cushioned, otherwise, nose breakage, bearing failures, frame cracks, and even flashing may result. Actual cases have been noted where a railroad has mixed the several manufacturers' springs in the same assemblies. This results in loose springs and invariably some coils go solid, giving the lower nose a very hard blow. Actual breakage of the lower nose has resulted from incorrect springs.

The same thing occurs if excessive clearance develops anywhere in the assembly. Such clearance may result from wear of the lugs on the truck bolsters, or wearing of the surfaces of the spring planks. Also, wear of the plates on the upper and

*(continued on page 62)*



Wear pattern of a gear with a straight tooth pinion,—note cracks.

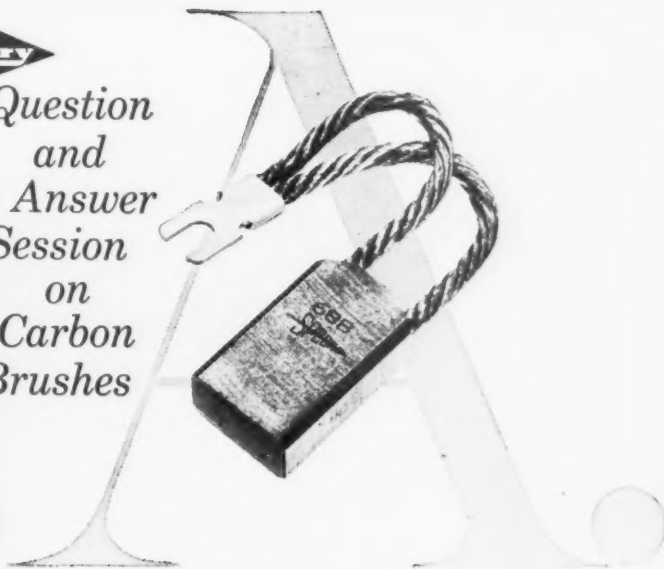


Wear pattern of a gear with a pinion with a slight taper.





## Question and Answer Session on Carbon Brushes



that says a lot...about **QUALITY**

*Sperry Rail Service, Danbury, Connecticut, designers and operators of Sperry Detector Cars, inspect thousands of miles of rail in track for the nation's foremost railroads. Sperry cars have used Speer Carbon Brushes in their rail current generators since 1935.*

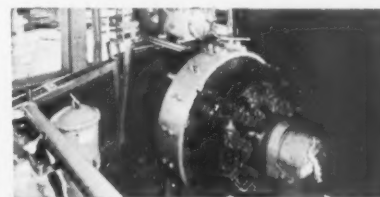
*Knowing that there must be some good reasons for long use, we asked the Sperry people to tell us why. Here is their answer:*

"In our operations it is important that every Detector Car have a dependable source of high-amperage, low-voltage current for testing purposes under a wide range of temperature and atmospheric conditions. Our cars have had to test in temperatures from 40 to 50 below zero to over 100° F. In the hot climates the generating compartments on our cars reach temperatures of approximately 130° F. The Speer #688 Brushes with their long life, excellent electrical characteristics and good cleaning action have given us the highest performance at lowest cost possible. We have tried other makes but have been unable to find brushes which compare with the ones we are using.

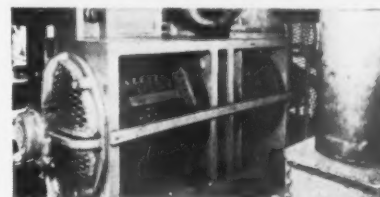
"In every Detector Car we use Speer #688 Brushes on both Rail Current Generators. One of these is a Chandeysson H8-43 Homopolar Generator from which we take 9,000 amps. at voltages from approximately 1.5v to 2.2v. This generator uses 192 brushes. The other is a Chandeysson BP17 Double Commutator Generator from which we take from 1,500 to 2,000 amps. from each side — double these figures for total output, also at voltages of from about 1.0v to 2.0v. Eighty brushes are used per unit. On this generator the commutator mica is not undercut but left flush with the commutator surface. This requires a hard brush with good cleaning action such as the Speer 688.

"The Speer Carbon Company representative has maintained close personal contact with us since we started using Speer brushes. To our way of thinking he is the most competent authority on electrical commutation we know."

This is but one railroad customer reaction to one type of Speer carbon brush for railroad use. Speer brushes can do as much for you and there is a type for every kind of railroad application.



Chandeysson BP17-4000 amperes, 2-volt generator uses 64 #688 Speer Brushes



2 Chandeysson H8-43 Homopolar Generators produce 4500 amperes, 2 volts per unit. Each uses 96 #688 Speer Brushes.

Available for the asking is the book, "Brushes by Speer," which describes the complete line of Speer Brushes.



# SPEER

Carbon Co.  
St. Marys, Pa.

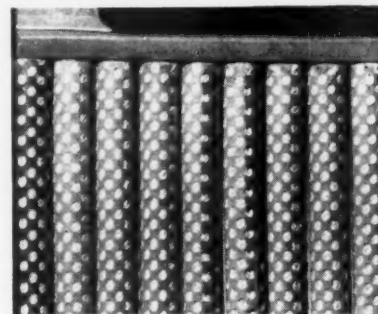
# EXIDE DEVELOPS NEW, IMPROVED, MORE

*Photo courtesy Reading Railroad*



**New MGD Exide-Ironclad Battery** for diesel locomotives. Designed to conform with recommended practices of Association of American Railroads.

**ADVANCED TUBULAR CONSTRUCTION—  
DEVELOPED OUT OF RESEARCH  
STARTED 15 YEARS AGO**



**Armored porous tubing.** Provides resistance to shedding and effects of vibration, improved flexibility, and maximum retention of active material. Thousands of tiny openings mean . . .

# ECONOMICAL DIESEL LOCOMOTIVE BATTERY

***New MGD Exide-Ironclad Battery design unlocks more power from battery space—gives you increased savings on investment and operations***

Now Exide-Ironclad diesel locomotive batteries are thriftier than they ever were. Always famous for long life and high performance, now they offer improvements that mean even higher capacity per dollar.

Exide has achieved these new benefits for diesel locomotive users by taking full advantage of the extremely high permeability of the armored porous tubing and its improved active material retention characteristics. This highly permeable tubing, made of braided glass fibers within a perforated polyvinyl chloride armor, acts like a highly efficient filter, preventing practically any loss or shedding of active material. Yet the high porosity enhances contact between electrolyte and active material—significantly improving battery performance.

## **How you benefit**

The new MGD battery packs more power per plate than other diesel locomotive batteries. It gives you a 50% increase in amperes discharged at diesel engine cranking rates even over previous model Exide-Ironclad Batteries.

The MGD is available in two sizes: 280 and 420 ampere-hours at the 8-hour discharge rate. In both, concentration of battery power reduces the space required. The MGD-19 (420 ah capacity) battery normally used in large road locomotives is now available within the dimensions of batteries furnished in smaller switching locomotives without sacrifice in cranking,

standby performance and life. This means new versatility and the possibility of reducing the number of sizes of batteries needed.

## **Same Exide-Ironclad quality features**

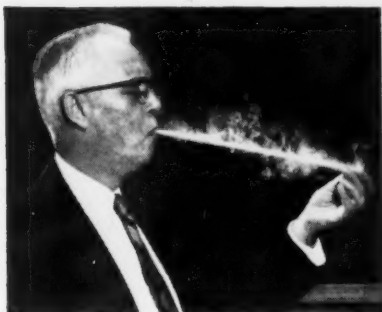
With all these improvements and new battery economies, you still get the quality features that contribute so much to the proven performance of Exide-Ironclad Batteries: heavy copper inserts in terminal posts and cell connectors to insure high sustained voltage during cranking; large electrolyte reservoir above plates to reduce watering requirements; ample sediment space in bottom of jar for long life; rugged molded rubber container built to withstand locomotive operation and provide for reduced maintenance.

## **Discover how much you can save**

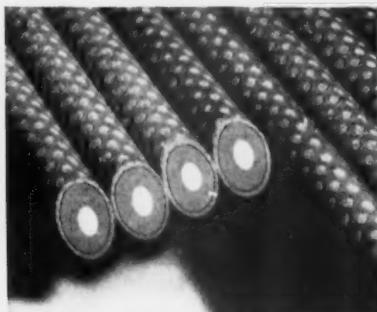
Learn how much you can benefit from the advantages this battery offers. Call your nearby Exide representative. Or write for complete information. Dept. MG, Exide Industrial Division, The Electric Storage Battery Company, Philadelphia 2, Pa.

# Exide®

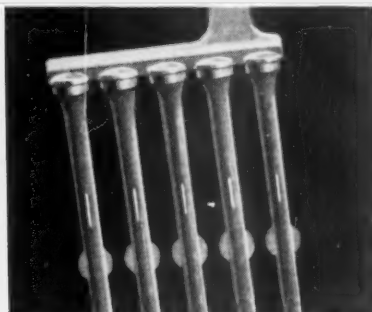
THE ELECTRIC STORAGE BATTERY COMPANY



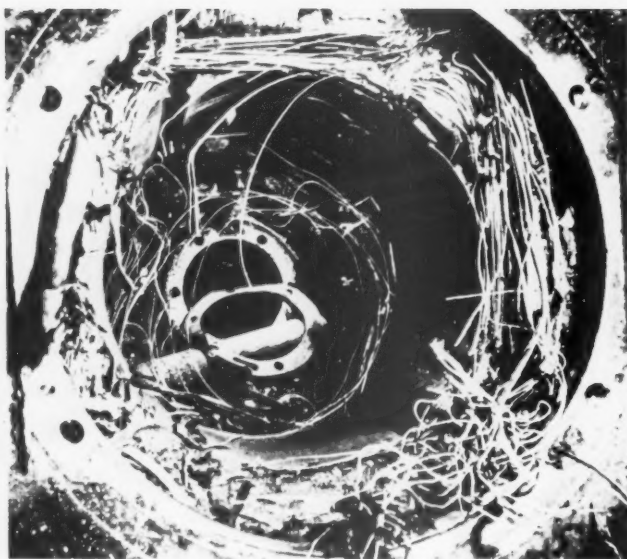
**Greater porosity.** Highly permeable tubes ease current flow, reduce internal resistance, improve access of electrolyte for superior performance under heavy loads. Each plate delivers more power. Tubes hold...



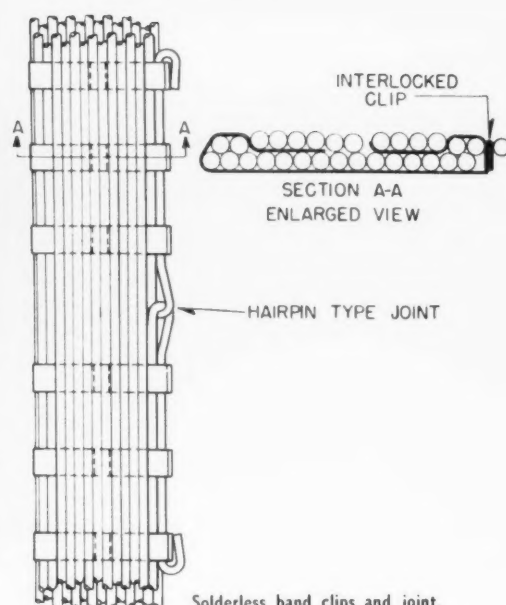
**More active material.** Chief source of battery power. Larger inside diameter of tubes means every positive plate contains more active material per cubic inch of plate. You get all this...



**Plus Silvium,\*** Exide's patented grid alloy—proved more corrosion resistant than any other grid alloy. Tests prove conclusively that Silvium prolongs battery life.  
\*U.S. Patent



Wrecked motor with band failure.



Solderless band clips and joint.

lower nose increases the clearance. Overhaul of the motor in the shop must include bringing the dimensions between the upper and lower nose to the original tolerance.

Experience has shown that the original 362 lower motor nose design was more prone to break than others. A redesign was made and thoroughly tested. Tests were set up by clamping the motor frame to a bedplate and then dropping a heavy weight a specified distance against the lower nose. The new design outlasted the clamping bolts in the tests. Field tests later proved the new design far superior to the old as stress concentration was reduced. The design was made stronger in several ways. There is more material in the throat of the support due to method of welding. The failures usually occur in the throat so additional material across the throat aids considerably. Also, a support much the same as a web acting as a heel was added to the design. The repair shops can add the design to any 362 motors.

Another feature developed through experience is arcing horns. These provide a minimum gap to ground at a point where burning will do the least damage in case of a flashover. They can be added to Westinghouse motors and generators by the repair shops.

Careful examination of the bearings will usually bring out defects where replacements are necessary.

Good lighting and visual magnification are necessary for such inspections. Even new bearings must be carefully handled to avoid acid staining of the hands or contaminating of the grease. Special facilities and instructions are necessary for proper handling of roller and ball bearings in railway machines.

#### Use of New Taper Pinions

Many gears in use on traction motors develop characteristic fatigue cracks at the root of the tooth. These are on the inboard end of the gear which is the most heavily loaded zone. Field examination of many cracked gears showed a uniform wear pattern with point of contact commencing at the inboard end and extending 10 to 30 per cent across the tooth. Contact between the pinion and gear was being made over only a small area. There was a slight difference in wear pattern on the two sides of the tooth. The poor wear pattern resulted from such things as motor shaft deflections, motor axle bearing clearance and deflections of the gear or pinion teeth.

Hand fitting was not practical, but obviously tapering the tooth would give a better contact condition. It was decided to taper only the pinion teeth for ease of cutting and as a minimum of teeth would have to be so ground. As field experience had shown a different wear pattern on the two sides, a special taper was

adapted for each side of the pinion tooth. The first tapers tried were approximately 0.003 total across one face, and 0.006 on the other.

Field experience showed great improvement in the wear pattern, but not all that was desired. We observed many gears and pinions shortly after they were placed in service to note wear pattern with various tapers. The final taper adopted gave almost 100 per cent contact across the whole tooth on each side. Breakages or cracked teeth decreased to almost nothing with the new pinions. All motors should have the new pinions applied during overhaul even if the old pinions without taper are in satisfactory condition. The improvement comes in longer life for the gears and freedom from cracks.

#### Steel Banding Improvements and Glass Banding

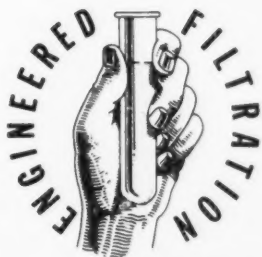
Two major advances have been developed in recent years in the banding of traction equipment. The first was the application of solderless steel bands. This was a major step in overcoming trouble as melting of solder on bands due to eddy currents or high temperature air on the face of the armature due to lack of proper cooling air has been a major source of failure. Since solder running is the usual initial cause of failure, the first improvements dealt with the elimination of solder in

(continued on page 64)





**BIG, BURLY, BEAUTIFUL**  
*...and oh, so Vulnerable!*



Any care less than the very best, for Railroad Diesels, just doesn't make sense! Despite its size and cost your Diesel engine is exactly as susceptible to the ravages of dust, dirt, grit and other contaminants as the cheapest car engine.

Compare the care the motorist gives his \$2000 car with that given a \$2,000,000 Diesel locomotive! Today's car engine has the protection of a lubricating oil filter, a gasoline filter and an air filter...all with a high degree of engineering back of them.

On the other hand, there are still some railroads that are packing cans with waste to filter Diesel lubricating oil. Of course, the majority have a more enlightened appreciation of the menace of dust and dirt. Many employ WIX Engineered Filtration as standard practice.

WIX has invested thousands of man hours in research... the engineering has been done... the facts are here for your engineers to read. WIX is ready with proven filtering media for both fuel and lube oils, plus years of Railroad filtration "know-how". Write for full information today.

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holding the clips and fastening of the steel wire end.

The so-called hair pin lock at the wire end eliminated all necessity of soldering the wire. Also, overlapping the strips or clips securely held them in place without the use of solder so that in a final steel band design, solder was unnecessary. The repair shops can apply this modern type of steel band to any armatures.

As everyone knows, the steel armature bands contribute to the severity of a failure when they are burned loose. The banding wires scattered inside of motors after some failures are often referred to as a "Rat's Nest." Also, the steel banding wire has rubbed through insulation causing grounds and costly repairs. No matter what troubles they produce, banding is necessary to hold the coils rigidly against throw-out at high speeds.

### Polyester Banding

A second major development to overcome the past failures of the steel banding has been polyester glass banding. The replacement of stainless steel bands with an equally strong, non-magnetic, insulating band has some obvious advantages which are rapidly being recognized. It is evident that the glass polyester in this application must be capable of withstanding the same stresses and must perform the same functions as the steel bands. In order to accomplish this end result, the glass polyester band must be applied under similar tension as the steel so that it will duplicate the conditions specified in steel banding.

Glass polyester bands consist of a Fiberglas non-woven parallel glass yarn tape impregnated and bonded with a thermosetting polyester. The tape is laid up unilaterally without any cross weave. A longitudinally woven tape is used which is held together weakly by the semi-cured polyester during application. The tape exhibits a remarkable strength in the direction as it has no cross weave to shear or break the longitudinal threads under tension. The tape is applied to the armature under tension. The polyester is completely cured during the baking cycle thus binding the matrix into a homogeneous mass.

Glass polyester tape can be applied under the same tension as steel. It is recommended that the physical dimensions of the band when compared with steel be increased 50 per cent.

### Field Coil

In rehabilitating field coils for traction service, the following adverse conditions must be considered: atmospheric contamination by diesel oil, brush carbon, chemical laden dirt picked up from the road bed, and chemical acids induced into the motor during the cleaning of the locomotive, and in addition extreme humidity and temperatures.

The type of insulation selected where rewind is necessary and the method of co-ordinating the various varnish and compounds used to seal the coil must result in a combination that will give high mechanical strength, good abrasive resistance, tear strength, elasticity, compressive

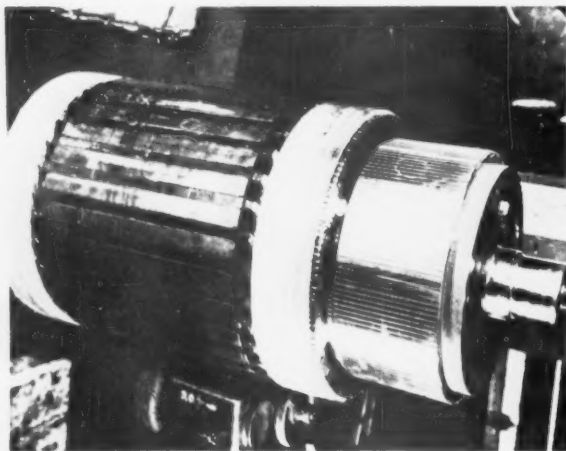
strength, moisture and oil resistance. In addition, they must lend to encapsulation or mummification processes to give a complete sealing of coils against the entrance of oil and dirt.

After two years of intensive development and test, coils are now available with a new insulation arrangement that will meet all of these conditions. The actual insulation would be silicone bonded asbestos between turns followed by a blocking and heat pressing to proper size and shape, taping all coil leads with silicone mica tape, ground insulation of silicone bonded glass and mica tape, and a finish tape of untreated glass to provide a foundation for final treatment of the insulated coils consisting of vacuum and pressure impregnation of a filled epoxy resin. The baking cycle is recommended to be 8 to 12 hours at 150 deg C.

Potting the coils integral with the poles is a further improvement. This fills the voids between pole and coil preventing the accumulation of dirt and oil in such pockets, and improves the conduction of heat from the coils to the poles and frame of the motor. Potting can be done during impregnation or it can be done by mounting the coil on the pole piece and filling all open voids between coil and iron with epoxy potting compound.

### Armature Coils and Assembly

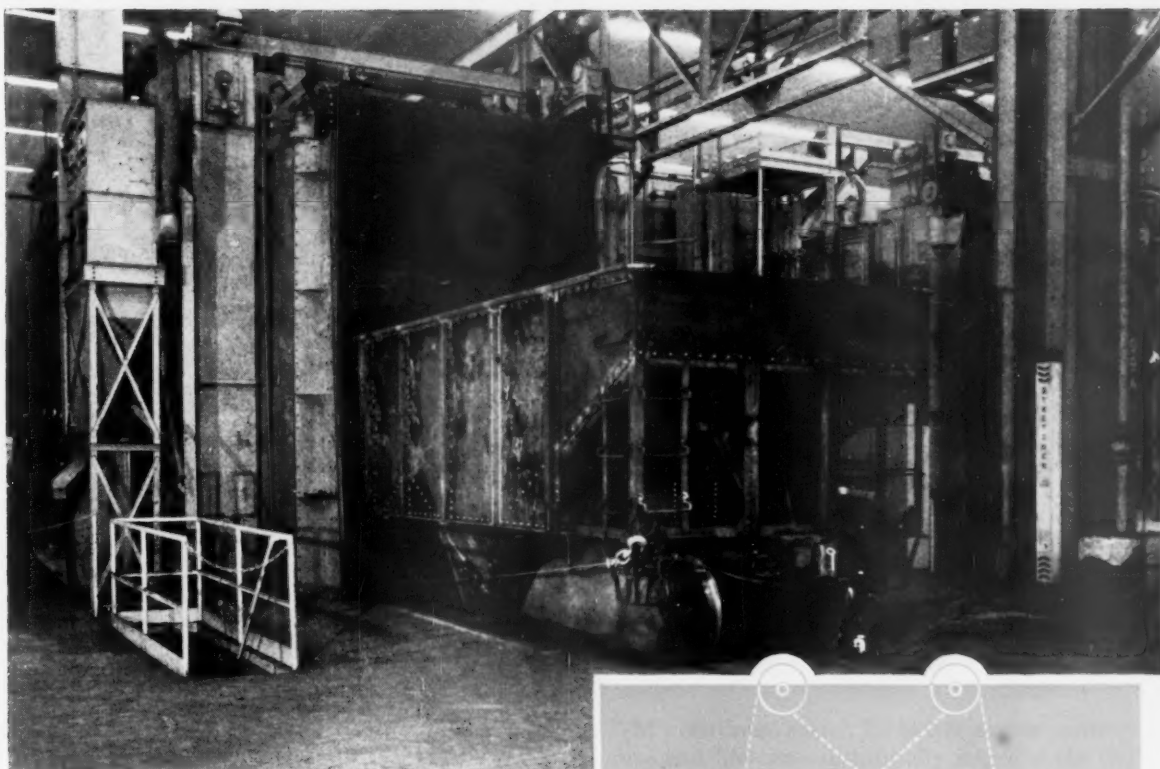
NEMA Class HHB-V armature coil insulation meets the requirements of traction service. Experience (continued on page 70b)



Armature with glass band.

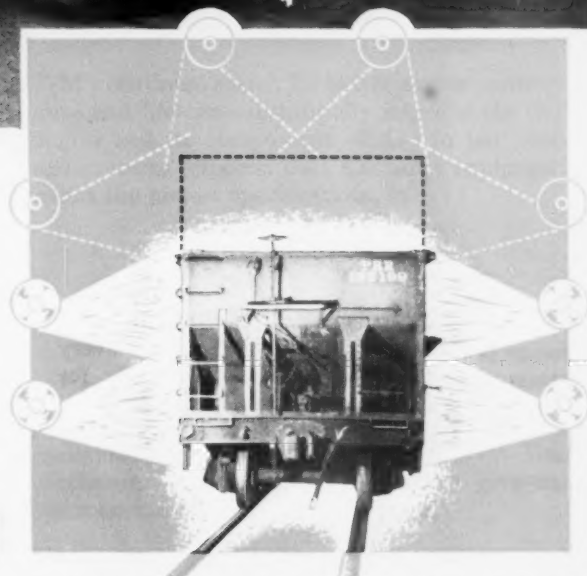


Field coils potted on poles.



## AUTOMATIC Pangborn Rotoblast cuts freight car cleaning time 85%!

In the Pennsylvania RR's Samuel Rea Shop, Hollidaysburg, Pa., hopper cars and boxcars are Rotoblasted before painting and stenciling. With the equipment previously used for this job, five men each spent an average of 2.7 hours cleaning a typical 42-ft. hopper car. Today, using special Pangborn Rotoblast Rooms for the same job, the railroad has cut labor to *four* men per unit—and they *turn out four cars every hour!* In addition to cutting man-hours 85%, the quality of cleaning is far better than before.



If you have an unusual cleaning problem, Pangborn offers a special service. Pangborn engineers will study your problem and its relation to your production line. Then they will design a Rotoblasting machine for your particular needs. Find out now how Pangborn's engineering service can give you better cleaning and faster production at lower cost.

Write today for Bulletin 1210A to PANGBORN CORP., 3700 Pangborn Blvd., Hagerstown, Md. *Manufacturers of Blast Cleaning and Dust Control Equipment.*

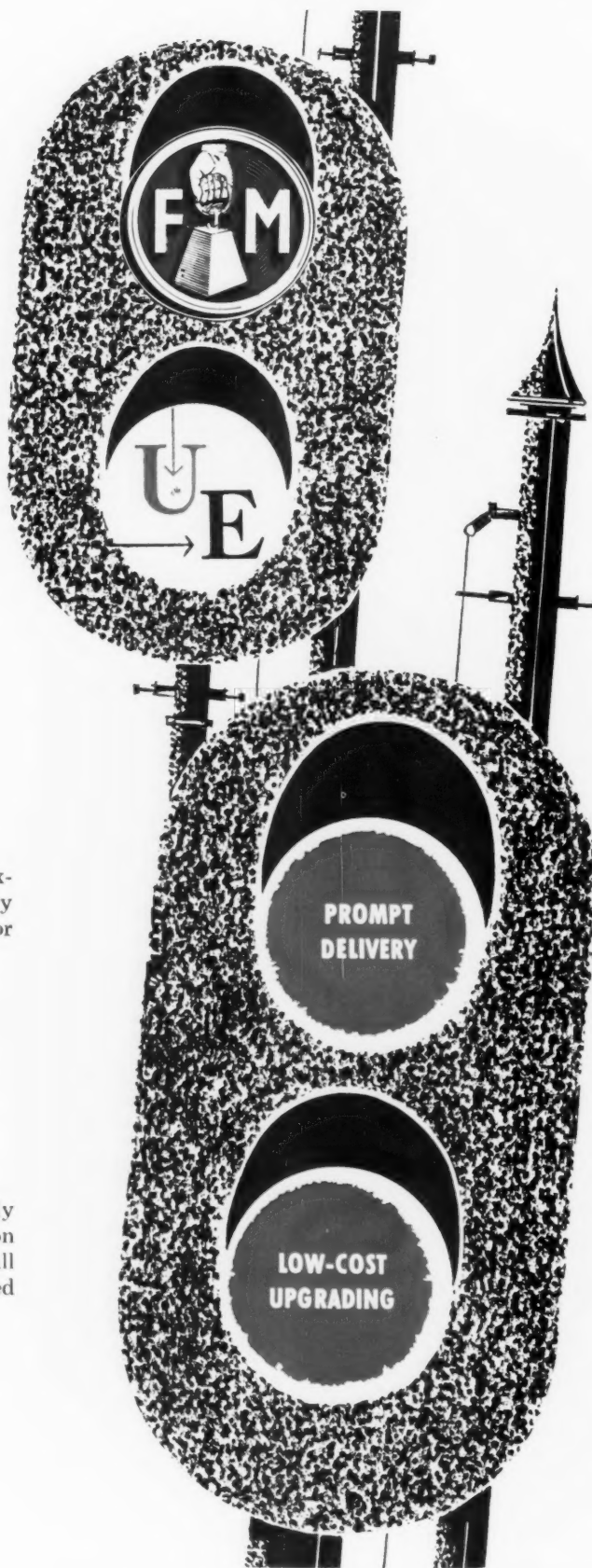
# Pangborn ROTOBLAST® cleans cheaper

#### UNIT EXCHANGE

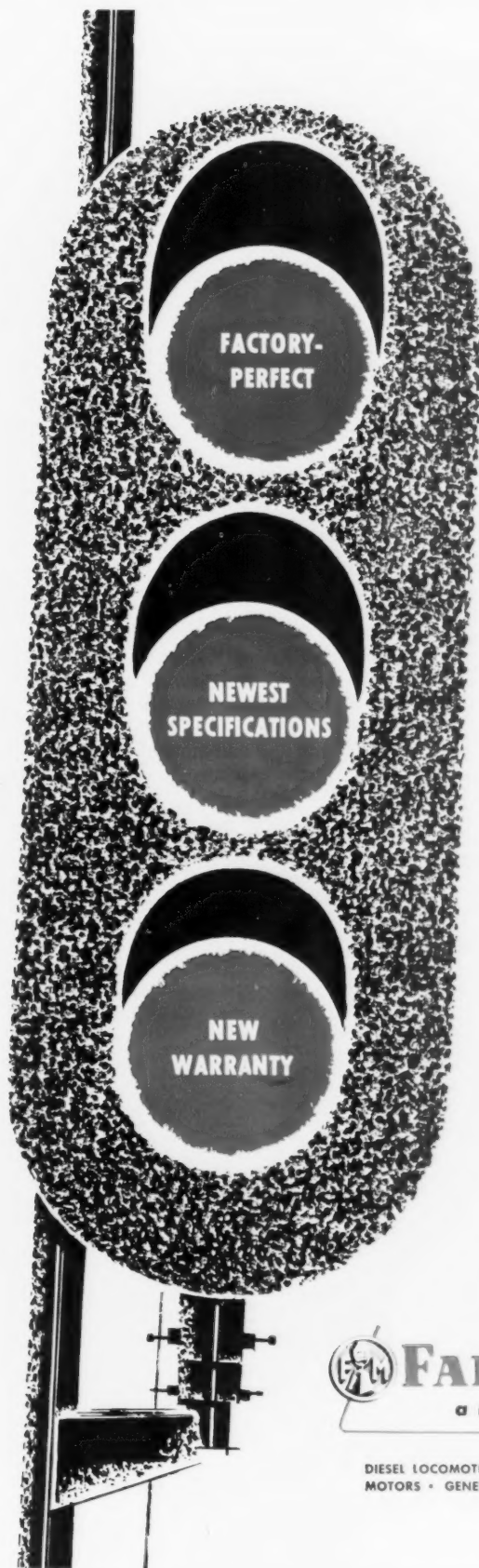
The only engine better than the O-P you have is an Opposed-Piston diesel made better by Fairbanks-Morse — available NOW through F-M Unit Exchange.

Due to a 60% increase in the F-M Unit Exchange program, there are O-P engines of every rating and major accessory group ready for prompt shipment on your order.

This F-M program enables you to effectively meet increased tonnage demands being made on your motive power fleet, yet reduces costs all along the line—lower maintenance, reduced shop facilities and lower parts inventory.







The only engine better than the O-P you now have is one "made better" by F-M craftsmen, who have the skill and techniques acquired through daily experience with only *one* engine design.

F-M's continual search for better engine performance and life can substantially improve the O-P engine and its components of five to ten years ago in many respects. Unit Exchange equipment meets the newest specifications.

Each engine, blower, pump, injection system, generator and traction motor in the F-M Unit Exchange program is warranted to give the same performance as new equipment.

For full details and delivery schedules, write: Diesel Locomotive Service Department, Fairbanks, Morse & Co., Chicago 5, Illinois.



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DIESEL LOCOMOTIVES AND ENGINES • MOTOR CARS AND RAILROAD EQUIPMENT • ELECTRIC MOTORS • GENERATORS • PUMPS • SCALES • WATER SERVICE EQUIPMENT • HAND LAMPS

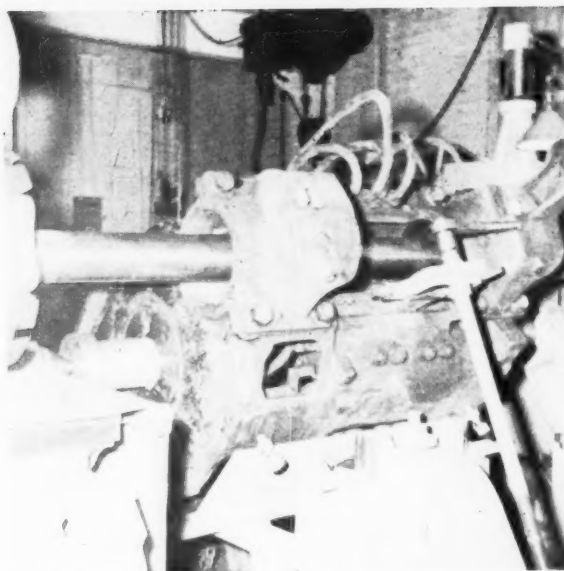
# SP&S

## Quartering

### Machine Bores

### Motor Support

### Bearings



EMD traction motor support bearings being bored on Niles quartering machine.

A Niles quartering machine, adapted for boring either EMD or Alco-GE diesel locomotive motor support bearings is one of the newest developments at the Vancouver, Wash., shop of the Spokane, Portland & Seattle. This railroad, now fully dieselized and currently disposing of its last steam locomotives, found itself no longer in need of a machine to bore crank pin holes in mounted driving wheels so that the main pins will be in exact quarter,

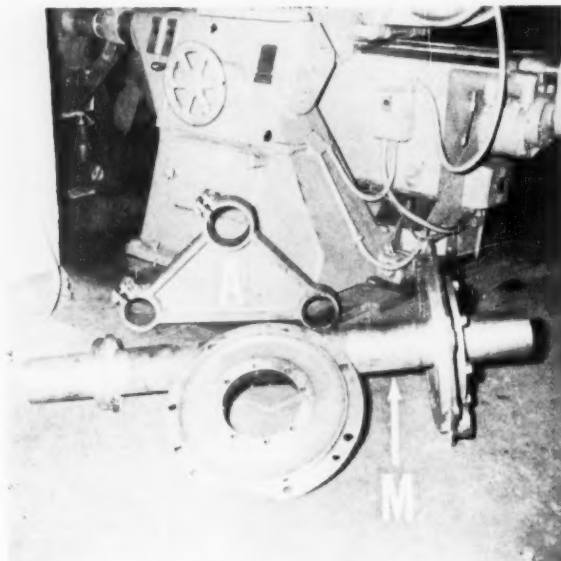
By constructing an adapter and mandrel, and making certain other changes in the machine, it is now successfully used for boring motor support bearings quickly and accurately at a single setting of the motor housing and without even an indexing operation.

The short 4½-in. boring bar in the main head of the machine is removed and replaced with a 4¾-in. boring bar, 91-in. long, made from a Mallet locomotive piston

rod and equipped with a cutting tool having micrometer adjustment. The machine centers are adjusted to the same distance from the boring bar center line as the standard armature and motor support bearing center spacing. This is 17.111 in. for EMD and 18.444 in. for Alco-GE motors. To facilitate changing from one set-up to the other with minimum delay and no special measurements, accurately ground  
(continued on page 70)



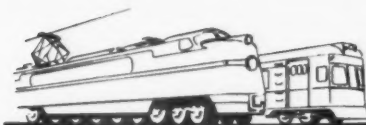
Mandrel M holds motor housing between centers and adapter A forms outboard support for boring bar.



Mandrel M and adapter A used in boring Alco-GE type motor support bearings.



**DIESELS**



**ELECTRICS**



**MU CARS**

# ALL

can have

## EXTRA, TROUBLE-FREE MILEAGE

with Magnus traction motor support bearings

EVERY make and model of diesel-electric and electric locomotives or MU cars ever built can take advantage of the extra precision and trouble-free performance of genuine Magnus HIGH MILEAGE traction motor support bearings. These super-precision replacement bearings, designed and built by bearing specialists, can be obtained by any Railroad directly from Magnus Metal Corporation.

Each of the features at the right makes an important contribution to that extra safety factor found only in Magnus traction motor support bearings. And the present-day trend to higher mileage between motor overhauls call for this added cushion against costly breakdowns.

What's more, Magnus high-speed, high-precision production methods can manufacture these bearings so economically that relining or rebuilding is both unnecessary and impractical.

For the complete story on Magnus HIGH-MILEAGE traction motor support bearings, write for your free copy of Bulletin No. 6000, Magnus Metal Corporation, 111 Broadway, New York 6, or 80 E. Jackson Blvd., Chicago 6, Ill.



### FEATURES

1. Perfectly mated bearing halves
2. Heat-resistant Satco lining metal
3. Interchangeable double keeway
4. High strength brass backs
5. Improved flange fillet profile — no "feathering," no "riding."
6. Precision finish boring to extremely close tolerances.

### OTHER MAGNUS PRODUCTS FOR DIESEL LOCOMOTIVES



Wheel Flange  
Lubricators



Safety  
Valves



Fuel  
Tank  
Sight Gages

**MAGNUS**  
**High Mileage**

**TRACTION MOTOR SUPPORT BEARINGS**

**MAGNUS METAL CORPORATION** *Subsidiary of* **NATIONAL LEAD COMPANY**

spacing blocks have been made for insertion on inclined ways under the machine heads. These automatically bring the centers to the desired spacings.

The adapter, fabricated locally by welding and machined with a high degree of accuracy, has one bearing on the right center bar of the quartering machine, and one on the original short boring bar which is left in that side of the machine. It is, in effect, an outboard support for the new long boring bar. Obviously, adapters identical in design but differing slightly in center distances are required for EMD and Alco-GE motor housings. The one shown in the machine in one of the views is for EMD and the one on the floor in another view is for Alco-GE. Referring to the latter, it will be noted that two of the circular bearings are split for firm clamping around the machine center and boring bars. The third circular bearing is a close running fit on the long boring bar.

Two similar mandrels are also required, the one shown disassembled

on the floor being Alco-GE. It consists of a center bar designed to fit between machine centers, having a fixed center plate on one end for application and bolting to the stator bore and a loose center plate which is slipped over the center bar and bolted to the other end of the stator bore.

Necessary changes were also made in the central work support bracket, originally designed to hold locomotive driving wheels and now enlarged and adapted to support traction motor housings. Means for attaching the upper end of the 2-in. tie bar to the motor housing are also provided so the housing may be revolved slightly in either direction about armature centers, as required when centering the boring bar in the motor support bearing hole.

In operation, the motor housing, with mandrel in place, is set on the central bearing bracket and raised slightly until the bar lines up with machine centers which are then secured in place. Adjusting screws in the central bracket are tightened up

against the housing to give full support. Bearing caps are applied over the boring bar, the bore centered by use of tie-bar and both bearing surfaces trued in perfect alignment with each other and accurate within .001 in., or less.

The motor housing shown in the machine is an EMD type and this motor was shopped because of a bearing cap which ruptured when it contacted a rock that rolled between the rails. This bearing cap was repaired by welding which pulled the bearing slightly out of line so it had to be trued by removing .005-in. of excess metal from part of the bore.

In general, the bearing caps of all traction motors repaired at this shop are built up by electric welding, as required, and rebored. The manufacturers' tolerances for motor support bearing size are as follows: EMD—9.249 in. to 9.257 in.; Alco-GE—10.500 in. to 10.504 in. With the revised quartering machine arrangement, the SP & S finds it easy to keep within these limits.

## From the Diesel Maintainer's Note Book

### *Grounded by a Door Latch*

By Gordon Taylor

A FOUR-UNIT E.M.D. freight diesel locomotive was going about its business with everything working properly, when suddenly a ground relay action occurred in the lead unit. The fireman reset the ground relay, but almost immediately, it opened again. Once again the fireman reset the relay with the same result.

The fireman then wisely decided to isolate the unit, since it could not be operated with continuous ground relay action.

Since the trouble was on the lead unit, the crew decided to save the battery by allowing the engine to operate in idle position, and thus obtain some benefit of the auxiliary generator. Had there been engine

trouble, the engine could not have been continued in service; but in this case, it was proper to idle it to conserve the battery.

The locomotive being in level territory, handled its train to an intermediate terminal. At that point, it was necessary to reduce tonnage to three-unit capacity due to fact that the train was moving into heavy grades. The train continued on its way to the next maintenance terminal where the defective unit was inspected.

When inspection was made, it was found there was no evidence of a flashover at either the main generator or at the traction motors. This indicated that trouble was a grounded condition in the high voltage power circuits. This called for an inspection of various power cabinets.

When the door in front of the reverser was opened, a door latch

which was lodged between the reverser and the door, fell to the floor and the ground was cleared.

In the compartment just above the reverser compartment is a double door with two locks. One lock is near the top of the door, and the other near the bottom. These locks are welded to the inside of the steel plate door. The top lock had broken loose where it was welded, and had fallen into the compartment below where it lodged between the reverser and the reverser door in a manner that caused a ground in the high voltage circuit.

The only repair needed was to have the boilermaker weld the lock back in place.

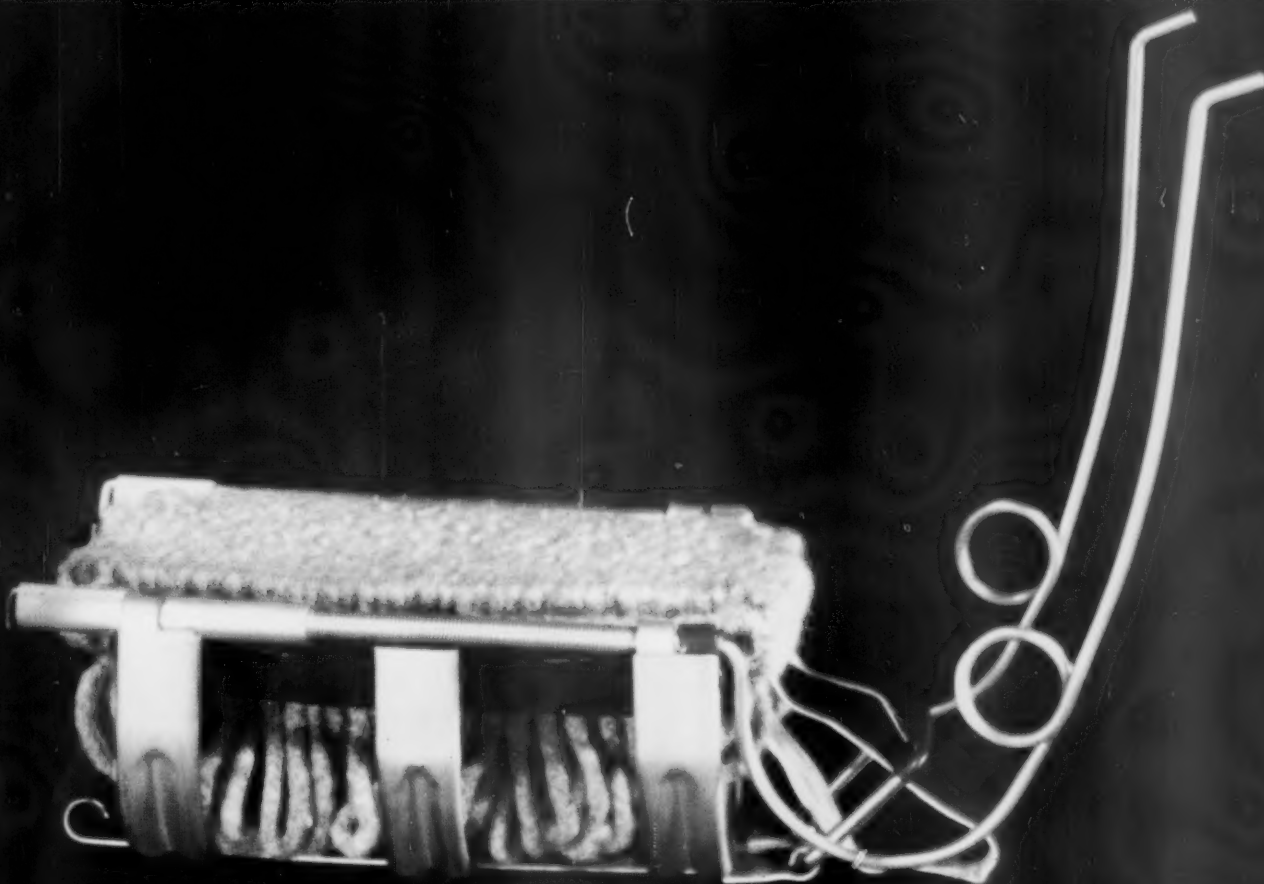
Very likely some maintainer had noticed that the door lock was starting to break loose, but did not attach much importance to it. He probably did not see how a loose door lock could possibly cause trouble, but there is simply nothing about a diesel that can be neglected if it is to give first-class service.

This series of articles is based on actual experiences of men who operate and maintain diesel-electric locomotives.



THE LUBRICATING SYSTEM THAT IS CHANGING THE THINKING OF RAILROAD MEN!

LI



PATENTS PENDING

The ROLIN transforms any journal box into a modern, non-mechanical lubricating system in minutes.

The flexible cradle frame fits the curvature of any journal box; holds the pad snugly against the journal.

Spring action holds the cradle in positive position, yet allows the pad to follow journal movements and prevents shock being transferred to the cradle. This flexible design also permits jacking of the box for easy removal of bearings without touching the lubricator.

The unique cord in the pad consists of a tough thread woven around an absorbent inner lining. These endless wicks suspended below the cradle provide a rapid and continuous "pipeline" flow of oil; with a high absorption and retention capacity furnishing a tremendous additional oil reserve.

This is the ROLIN . . . designed and engineered to guarantee you freedom from waste grabs, linting, glazing, freezing, oil starvation and other causes of lubrication failures.

*The ROLIN is now in general interchange service on 61 American railroads. For factual data and the truly interesting story of the development of this remarkable device, write:*

80 EAST JACKSON BOULEVARD • CHICAGO 4, ILLINOIS • WE bster 9-3587

THE  
*rolin*  
CORPORATION

# HOW MUCH DO YOU KNOW ABOUT BRUSHES?

## Should Brush Grades Be Mixed on a Commutator?

IN GENERAL, IT IS MISGUIDED operating practice to mix brush grades. Very few brush grades contain the same film forming properties and therefore, mixed brushes may not lay down similar films on a commutator. This is true even for different grades produced within a given company. The films from two given brush grades in the same wear track may be, and usually are, incompatible to the extent that the brush friction characteristics are changed. In the event the friction is increased, brush chatter, breakage, and film stripping may occur.

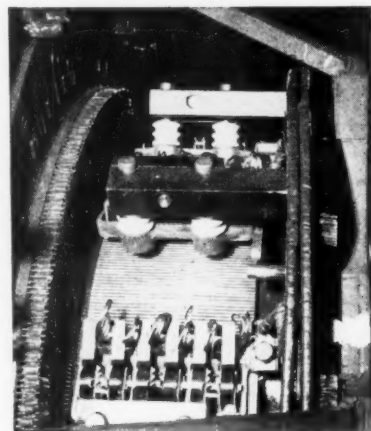
Mixing grades can also result in a cumulative filming effect on the commutator. This effect may lead to smutting of commutator bars and eventually bar burning.

Differences in contact drop between brush grades can also cause

selective action of current flow through the brushes in a given holder.

There are processing circumstances known only to the manufacturer of the brushes involved which may justify an agreement that two of the same producer's grades can be mixed on a commutator without any serious sacrifice in performance. However, this may only be recommended as a temporary expedient to enable the user to work off an inventory of an obsoleted brush grade. Mixtures of competitive grades can only be justified by tests. Usually by the time tests are completed, the need for them is gone.

One other condition may warrant the use of a different type of brush grade in conjunction with the standard commutating grade. This condition arises when contaminants in the atmosphere indicate a cleaner or gentle scouring action brush is necessary to prevent excessive filming



of the commutator. The filming properties of cleaner brushes are usually negligible. They are seldom specified as a standard grade for a machine and are used primarily for industrial applications.

By K. R. MATZ  
National Carbon Company

This is the eighth of a series of questions and answers which are appearing each month.

## Old Locomotives Can Be Made Better Than When New

(continued from page 64)  
ence indicates silicone bonded glass-backed mica tape applied continuously from turn end to turn end, ground insulation of silicone bonded glass-backed mica tape applied continuously in multiple layers completely around the whole coil followed by a cold and hot pressing results in a coil that will give long life in traction service.

Vacuum and pressure impregnation of the coil, plus vacuum and pressure impregnation of the completed armature are a requisite to meet the mechanical and centrifugal forces present in a traction application.

The selection of the correct impregnating varnish to meet service requirements is most important. The varnish should have high bonding

strength, good adhesion, durability, moisture and oil resistance, and high thermal stability. We have found the thermosetting type to give the best results, but the impregnating and baking cycle is most important regardless of the type.

Two outstanding points should be observed in rehabilitating traction armatures: (1) The armature must be clean and dry with a high megger reading before varnish treatment is applied. Varnish will not give a complete bond over dirt and failure is likely to occur as soon as thermal expansion cracks the varnish film. (2) The second important point in rehabilitating armatures is to note that high temperature solder must be used in making all connections. Residual solder must be removed as mixing of solders results in a

lowering of the solder melting point to a dangerously low temperature.

Insulating materials and design features of electrical apparatus are much greatly improved over those in use 10 to 15 years ago when diesel locomotive equipment was first produced in quantity. Repair shops usually duplicate original design, but this is not true for diesel motors and generators as repair design improvements have kept pace with modern practices. Encapsulated field coils, new insulation for armature coils, bands of glass material, and other features are now available for diesel motors and generators. These improvements will give longer trouble-free life than contained in the original design and the railroads stand to gain considerably in dollars through their use.

# Put your Wyandotte cleaning specialist to work ...anywhere

(his service is systemwide!)

Got a cleaning problem? Take it to an expert. That's the sure way to get things done right!

And if your problem involves railroad-cleaning costs, the man to see is your Wyandotte railroad-cleaning specialist. Here's why:

## FULL-TIME CLEANING SPECIALIST

Your Wyandotte specialist in railroad cleaning makes a career out of solving problems such as yours. Through years of experience, he has amassed a tremendous store of practical knowledge about cleaning products, methods, and procedures . . . both on an individual-shop basis and on a systemwide basis.

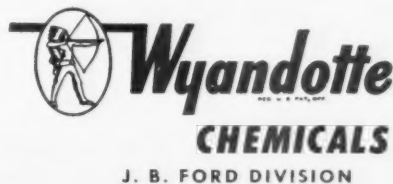
## SYSTEMWIDE SERVICE AVAILABLE

Your Wyandotte specialist is assigned permanently to your line. This means he devotes his time to improving cleaning on your road. He's not restricted to any local area, and can provide service on a systemwide basis—thus co-ordinating his activities with your requirements

for mechanical, purchasing, and test departments. He can help you eliminate overlapping inventories, too!

Think of the convenience! You turn all cleaning problems over to one man—a man with the time and know-how to solve them.

Why not take full advantage of this service? We're proud of what we have done for other railroads . . . we would like to work with and help you, too. Get more details by writing us, today! *Wyandotte Chemicals Corporation, Wyandotte, Michigan. Also Los Nietos, California. Offices in principal cities.*



COMPLETE LINE OF CLEANERS FOR ALL RAILWAY NEEDS

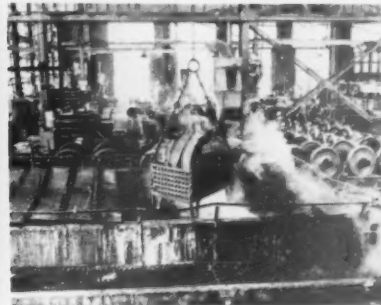
## SOME OF THE THINGS A WYANDOTTE RAILROAD-CLEANING SPECIALIST CAN DO FOR YOU!



A Wyandotte railroad-cleaning specialist can help you clean the inside of a diesel or locomotive for less than \$1.50—and save one third of the labor cost!



He can show you how to strip paint from a box car, rinse and phosphatize it, for about \$5.00—and do the complete job within five to nine minutes!



He can improve vat-cleaning operations on the toughest jobs—diesel trucks, wheels, engine parts—increase cleaning efficiency, lower cost to as little as 2½¢ per ton!



Land Transportation Committee, American Institute of Electrical Engineers in session at its October 9, 1957 meeting in Chicago.

## Things to Come . . . . .

PLANNING FOR FUTURE railroad needs, the Land Transportation Committee of the American Institute of Electrical Engineers will present papers on computers as a

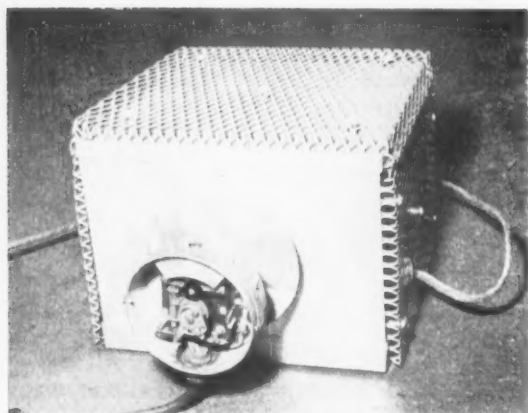
means of determining train performance and equipment design at the AIEE Winter General Meeting to be held in New York, February 2-7, 1958.

Another contribution to be offered at this time will be a simple chart by means of which any railroad may closely approximate the financial return which might be made by any railroad by electrifying any part or all of its lines.

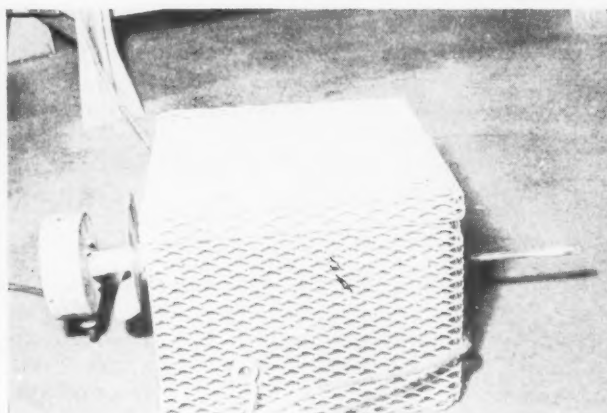
Others will outline railway dieselization trends in North and South America, a static control system for gas turbine locomotives, and non-destructive evaluation of insulation.

At a joint meeting with the Railroad Division of the American Society of Mechanical Engineers to be held in Cleveland, Ohio, April 9-10, 1958, the result of studies concerned with dollar value of damage done to diesels by dirt will be given. Up-to-date information on wheelslip protection will also be presented.

Also in process of study are many of the problems concerned with rapid transit which is now of primary interest in passenger transportation.



A stack switch being brought up to a temperature of 900 deg F. in the heater box.



With the stack switch put in from one end and the thermometer from the other, the two sensing elements are side by side.

## Stack Switch Checker

TEMPERATURE LIMIT switches for the stacks of Vapor steam generators are checked and adjusted periodically on the Chicago, Burlington & Quincy by means of the device shown in the illustration. It consists of a Baldwin cab heater in a 12-in. x 12-in. x 10-in. metal box which is insulated inside with asbestos and

glass wool. The expanded metal on the outside protects the worker from coming in contact with hot surfaces.

The stem of the limit switch to be tested is pushed into a hole in one side of the box and a 0-950-deg mercury thermometer is pushed into a hole on the opposite side so that


its bulb is adjacent to the stem of the switch.

The heating element is connected to a 120-volt power source and the temperature in the box reaches 900 deg F in about 30 minutes. In the process of bringing the temperature up, the switch is adjusted to open at 900 deg.





# Need Seamless Steel Tubing Immediately?



**Get "out-of-stock" delivery  
Call your USS Shelby  
Seamless Distributor!**

WHY WAIT FOR DELIVERY when you can get all the top-quality Seamless Steel Tubing you need from your close-at-hand USS Shelby Seamless distributor?

Phone him, write him, drop in and see him—and you'll get prompt, courteous and efficient service, the likes of which you've never seen before.

- The consistent high quality of USS Shelby Seamless Tubing, its dimensional accuracy and superior machining char-

acteristics make it easy to fabricate. Use it and cut tool costs, reduce rejects, save both time and money, and turn out a finer product.

- Shelby Seamless is available in round, square, rectangular, and other special shapes in any commercial size—from  $\frac{1}{4}$ " OD to  $10\frac{3}{4}$ " OD and in wall thicknesses from .035" to 2.000" . . . in a wide range of steel grades and anneals.

— Contact your Shelby Seamless Distributor now! —

NATIONAL TUBE DIVISION, UNITED STATES STEEL CORPORATION, PITTSBURGH, PA.

(Tubing Specialties)

COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS  
UNITED STATES STEEL EXPORT COMPANY, NEW YORK



**SHELBY SEAMLESS MECHANICAL TUBING**



UNITED STATES STEEL

# QUESTIONS and ANSWERS

## General Motors

### Diesel-Electric Locomotives

*This series of Questions and Answers pertains to General Motors diesel-locomotives. The references to manual and page numbers in the text indicate where the original material may be found in the builder's technical publications or instruction manuals. These are usually available to authorized employees on each railroad.*

#### Items Essential in All Units of Locomotive

**G653-Q—What is indicated if fuel does not show in the fuel return sight glass, when the fuel pump is running?**

A—If the fuel is flowing in the other glass (45 lb) next to the return sight glass clogged fuel filters are indicated.

**G654-Q—Can this condition be alleviated while on the road?**  
A—No.

**G655-Q—What may be the trouble if fuel is not flowing in either glass?**

A—The emergency fuel cut-off valve under the locomotive fuel tank may not have been tripped.

**G656-Q—If this valve is properly set what other defect may be responsible?**

A—The suction strainer may be clogged.

**G657-Q—What may be done in this event?**

A—If tools are available, the Wastex may be removed and the fuel element replaced without any Wastex.

**G658-Q—What should be done if it is found that engine is stopped?**

A—Pull the isolation switch handle up into *start* position.

**G659-Q—What checks should be made?**

A—The switches on the distribution panel should be closed and the fuses checked.

**G660-Q—What should then be done?**

A—The fuel pump should be switched *on* and the fuel return sight glass checked for a good flow of fuel.

**G661-Q—What other check should be made?**

A—It should be made certain that the low oil pressure trip button on the governor is pushed in.

**G662-Q—What indicates that the trip button is pushed in?**

A—The red part of the shaft does not show.

**G663-Q—How should the engines be started?**

A—The layshaft should be held part way open and the engine started by pressing on the *start* button.

**G664-Q—What then should be checked?**

A—The ground protective relays and the starting contactors.

**G665-Q—What should be the position of the isolation switch if the engine throttle is in No. 2 position or lower?**

—*Run* position

**G666-Q—What do you do if the throttle is in No. 3 position?**

A—Hold back on layshaft lever.

**G667-Q—Why is this done?**

A—To prevent a surge in engine speed.

To Ascertain If Engine Is Putting Out Power

**G668-Q—If the throttle is in Run 8, pulling a train, how should**

**the plate on the governor appear?**

A—As shown in Fig. 511, page 509.

**G669-Q—What may be wrong if the right hand scale reads idle, instead of 8?**

A—The isolation switch may not be in *run*, or ground protective relay may be tripped.

**G670-Q—If the right hand scale shows 8 but the marker on the left hand scale reads 8 to 10, what may be the trouble?**

A—The engine is not loaded and there is probably electrical trouble.

**G671-Q—What should be checked?**

A—The battery field fuse.

**G672-Q—What other defect may be responsible?**

A—The control pressure may be low.

**G673-Q—If this does not correct the condition, what should be done?**

A—The throttle should be reduced to *idle* momentarily and then return to *run* 8 and the scales on the governor plate checked again.

**G674-Q—How is the ground protective relay set?**

A—By isolating the engine, pressing on the ground protective relay set button, and then placing the isolation switch firmly in *run* position.

**G675-Q—What must be done if the relay continues to trip?**  
A—The engine must be isolated and shut down.

#### Failure Of Control Air Pressure

**G676-Q—What may be the cause for failure to obtain control air pressure?**

A—Control air may be shut off at the piping to the regulator or at the valve in the control cabinet.

**G677-Q—What may be the cause for low pressure in the system?**

A—The regulator may be set too low.

**G678-Q—How should the knob on top of the regulator be turned to increase control air pressure?**

A—Turn the knob clockwise to increase the pressure.

**G679-Q—From what other cause may the air pressure be too low?**

A—Control air is supplied from the main reservoir. If that pressure is low, it cannot operate the regulator to supply the control air system properly.

**G680-Q—What are the maximum and minimum control air pressure allowable?**

A—From a maximum of 90 lb to a minimum of 75 lb.

**G681-Q—Is it permissible to proceed in the event of a defective regulator which allows control air pressure to creep up to that of main reservoir?**

A—Yes, in case of emergency.

**G682-Q—What does this locomotive consist of?**

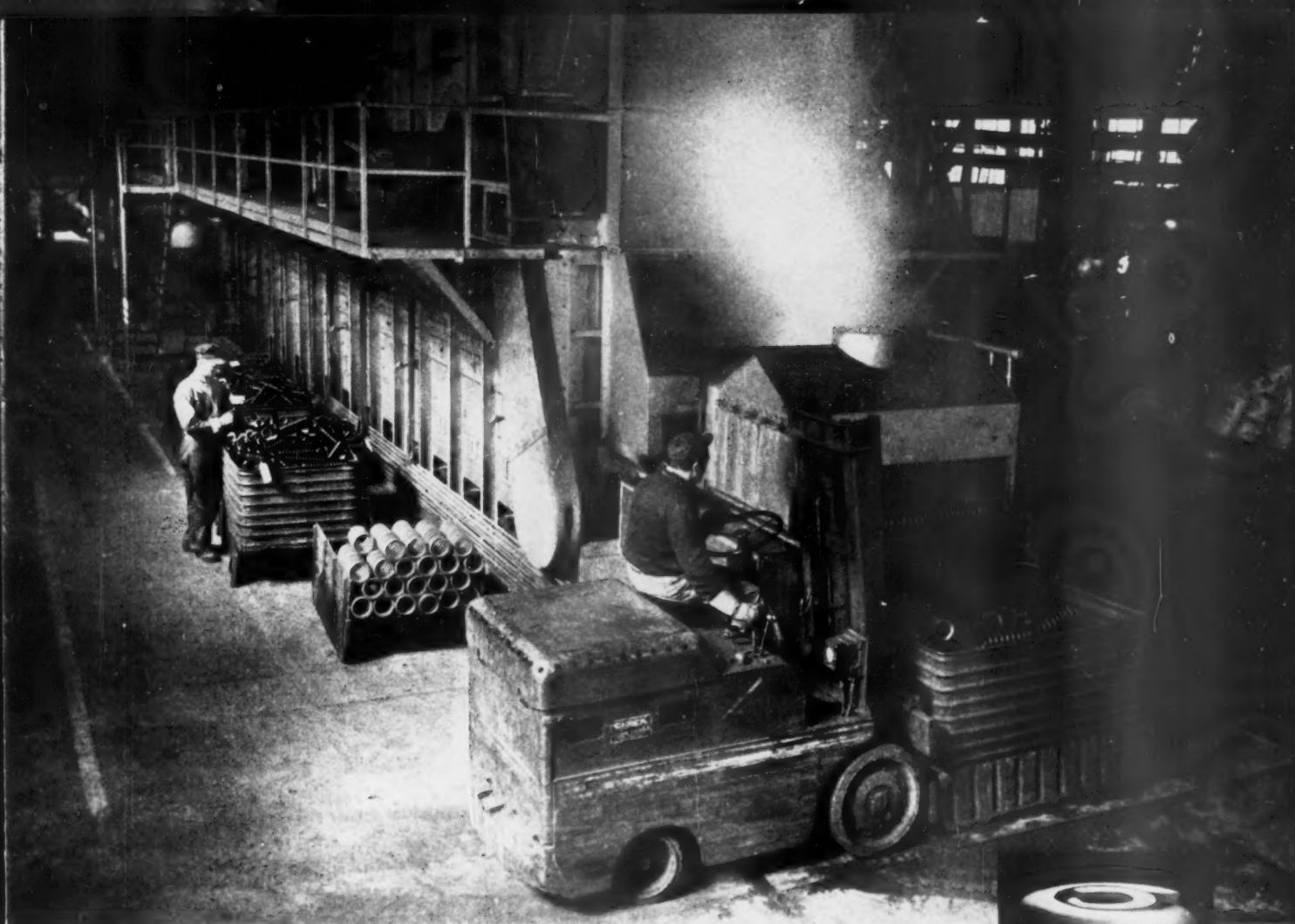
A—One unit rated at 1,500 hp.

**G683-Q—What may take place in some cases?**

A—In some cases, two or more units may be coupled together for multiple unit operation.

**G684-Q—Do all of the GP-7 locomotives have the same type of air brakes?**

A—No. They may be equipped with either of two types of air-brake equipment.



# ALCO FREIGHT CAR TRUCK SPRINGS GUARANTEED FOR 10 YEARS

Uniform quality Alco guaranteed springs are made to exceed AAR specifications; now you get even greater protection against replacement need.

On railroads around the world, ALCO springs have proved themselves again and again. They are so time-honored, ALCO can afford to guarantee these freight car truck springs against breakage for at least ten years.

ALCO FREIGHT CAR SPRING has date of manufacture stamped on coil. If it breaks within a period of ten years from that date, a new spring will be furnished free of charge by ALCO.

This ALCO guarantee applies to these springs\*:  
(Standard AAR Designs)

- |                     |             |
|---------------------|-------------|
| 1. 2 1/2-in. travel | 4. 1915-D   |
| 2. 3 1/8-in. travel | 5. 1936-D-2 |
| 3. 3 1/2-in. travel |             |

\*Except springs for brine refrigerator cars.

Order ALCO guaranteed freight car springs for your next requirements. You will be assured of top quality and superior service by one of the nation's largest railroad suppliers. Call your nearest ALCO Sales Representative or write Spring & Forge Division, Dept. SGR-3, P. O. Box 1065, Schenectady 1, New York.



**ALCO PRODUCTS, INC.**

NEW YORK

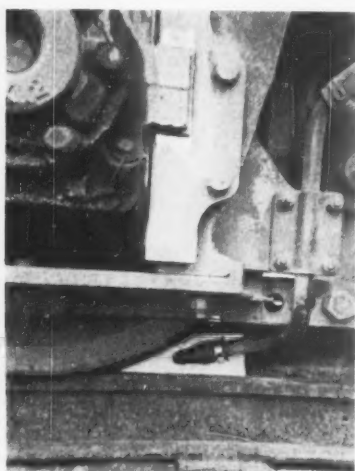
Sales Offices in Principal Cities

## WHAT'S NEW IN EQUIPMENT

(Continued from page 10)

try's specifications even under severe conditions.

Besides being moisture resistant, Transulite is lightweight, vibration resistant and durable. Its inorganic glass fibers will not burn, rot or sustain rodents and vermin. The material offers maximum resistance to sagging or settling when installed under industry accepted methods. *L. O. F. Glass Fibers Company, Dept. RLC, Toledo, Ohio.*



### Sand Pipe Nozzle

A rectangular Brewster No. 903 sand pipe nozzle is now available in addition to the current round-hole nozzle. It is made of Neoprene, and supplied with a hose clamp for application to 3/4-in., 1-in. and 1 1/4 in. sand delivery pipes.

According to the manufacturer, the nozzle can be applied within ICC ruling of 2 1/2 in. above the rail. The rectangular outlet is said to give a straighter flow of sand parallel to the rail, and the design does not permit water to travel up pipe through capillary action. Sand volume adjustment from 3/4 to 1 1/4 lb. per min. per trap is recommended for the nozzle. *Morris B. Brewster Co., Dept. RLC, 8 South Michigan ave., Chicago 3.*

### Wrecking Crane

A 150-ton diesel wrecking crane with operating cab at right front corner is designed to meet rail, bridge and trestle conditions where lighter axle load is necessary.

The diesel engine is equipped with a torque converter, with all clutches and friction reverse clutches air operated. A



curved wrecking boom is welded steel construction with alloy steel members. The main and auxiliary hoist sheaves have roller bearings, while the auxiliary hoist has a swivel sheave. The car is built of welded and riveted structural members, including alloy-steel side sills. *Industrial Brownhoist Corporation, Dept. RLC, Bay City, Mich.*

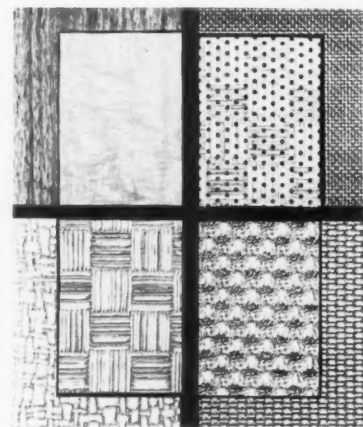


### Journal Jack

This 98-lb aluminum journal jack with a capacity of 200,000 lb is 12 in. in closed height and has a base diameter of 8 3/4 in. Two bail-type handles make the jack easy to carry.

The jack has a 4-in. raise and requires an effort of 120 lb to lift 100 tons. A lug on the ratchet makes it possible to spin the head, which is 5 in. in diameter, to load level rapidly. The jack is totally enclosed and packed with grease. It has a heat-treated lifting screw and bronze worm gear with a large capacity Timken

roller load bearing. Its shell casting and base are of aluminum alloy. *Duff Norton Company, Dept. RLC, P. O. Box 1889, Pittsburgh 30.*



### Plastic Laminate

Pearsonite, a plastic laminate material, is said to behave amazingly like lightweight sheet metal and faithfully retain the most detailed three-dimensional forms. Typical uses in the transportation field include interior trim, scuff guards and acoustical headlinings.

The material will not burn and resists abrasion from continued hard use. Being almost completely chemically inert, it is maintenance free. The product is easily worked and assembled in flat or three dimensional form with simple tools and equipment used by fabricators of sheet metal, plastics, fiberboard and wood.

The plastic is available in over 3,000 variations of color, texture, gage and perforating pattern, in 40 in. and 48 in. wide continuous rolls of up to 100 yd. It may also be obtained in large production sheet sizes: 40 in. by 36 in., 40 in. by 48 in., and 48 in. by 96 in. *Metallic Plastics Corporation, Dept. RLC, 27-10 44th drive, Long Island City 1, N. Y.*

### Hydraulic Power Cell

The Series 700 Power Cell is used with the manufacturer's Model 607 hydraulic tool designed for double-driving application of commercial or aircraft fasteners up to 1/2 in. size. The tool has an electrical toggle switch for selection of high or low operating pressure.

The power cell is a lightweight, porta-

(Continued on page 78)



**General Electric  
Motor Support  
Bearings**

# **SAVE OIL!**

**Are You Taking  
Full Advantage of  
This Important  
Benefit?**

General Electric motor support bearings have oil-return grooves. When you use these bearings on your locomotives in normal road and switching service, you'll find that up to 90 percent of the units can operate from monthly inspection to monthly inspection without the addition of oil to the axle caps.

**DEVELOPED FOR GENERAL ELECTRIC'S GE-752 TRACTION MOTOR**, these oil-return bearings have undergone extensive factory and field tests. These tests show that a locomotive in practically any type of service can get up to three times the mileage between oilings than would be possible with older style bearings. Besides giving you more miles between oilings, G-E support bearings give you

long life and save maintenance dollars through reduced oil consumption and more economical oiling schedules.

The wearing surface of all G-E lined motor support bearings is made of *tin base babbitt* for better bonding and resistance to breakage and wear under today's tough operating conditions. Precision boring and rigid construction means still less wear on bearings and traction motor gear.

**YOUR NEAREST G-E RAILROAD REGIONAL PARTS CENTER** or your locomotive builder will be glad to tell you about all of the features which make G-E motor support bearings your best buy. Always specify G-E traction motor support bearings . . . the bearings that are designed as an integral part of your G-E traction system. General Electric Company, Locomotive and Car Equipment Dept., Erie, Pa. 128-41



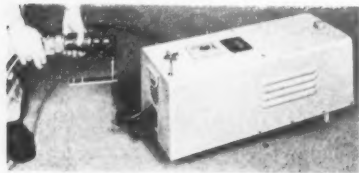
**DURING RECENT ROAD TESTS**, G-E motor support bearings were purposely bored out to simulate half-worn condition. Results from tests showed that even after wear, G-E bearings continue to save oil by returning excess oil to the axle cap.

*Progress Is Our Most Important Product*

**GENERAL  ELECTRIC**

## WHAT'S NEW IN EQUIPMENT

(Continued from page 76)



ble electro-hydraulic generator. It is mounted on three casters for towing and equipped with handles for carrying. It is designed with two separate system relief valves, one for low pressure and the other for high pressure operation. The low-pressure circuit is adjustable between 600 and 1800 psi in the standard design. The high pressure relief valve is fixed at 3000 psi.

The device has an air-cooled hydraulic system of 6 qt oil capacity. It is available in three models equipped, respectively, for 110, 220 or 440 volt input power. The latter model is equipped with a transformer to convert the power supply to 110-volt current. The drive motor is a constant speed ac unit and is nominally rated at 1½ hp. *Huck Manufacturing Company, Dept. RLC, 2480 Bellevue ave., Detroit 7.*



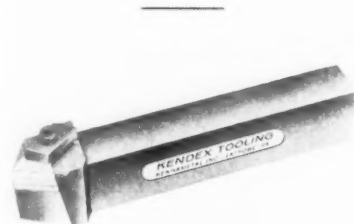
### Cord Reels with High Hp Ratings

Six new models of cord reels have increased the maximum horsepower range of these devices from a previous 1 hp to a present 7½ hp.

The line now provides a reel to supply current to electric hoists, cranes and other electrically operated mobile devices with motors having these characteristics

and maximum horsepowers:—110 volts, single phase, 60-cycle, ½ hp; 220 volts, 2 or 3-phase, 60-cycle 7½ hp. Wire sizes include a choice of No. 14 and 16 wire. Cord lengths up to 50 ft are available on certain models and when reels are mounted at the center of a runway or track, they will serve a track twice as long as the conductor cord. Rewinding is automatic.

The swinging guide rotates through an arc of over 290 deg and 4 rollers at its end feed the cord in any direction, even at right angles to the reel,—without cord damage. *Shaw-Box Crane & Hoist Division, Manning, Maxwell & Moore, Inc., Dept. RLC, Muskegon, Mich.*



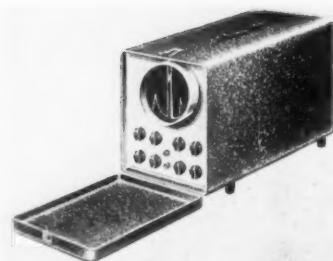
### Throw-Away Insert Tools

These heavy-duty triangular carbide inserts are ⅝ in. inscribed circle and ⅓ in. thick and are for use in three styles of holders. Style KTD-86A holders are for heavy plunge cutting on tracer control or automatic lathes. Style KTF-86A is for turning or facing on a square shoulder. Style KTG-86A is an offset tool for shaft turning or facing on a square shoulder. All holders are heat treated and have a hardened steel clamp and a solid carbide shim or seat. The inserts are available in either precision or utility types and are stocked in a number of grades. Chip breakers are available separately. *Kennametal Inc., Dept. RLC, Latrobe, Pa.*

### Electronic Engine Analyzer

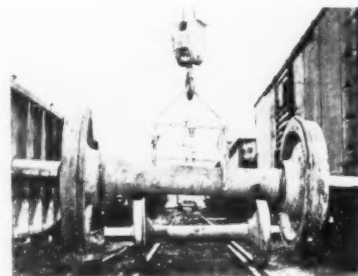
The Anal-O-Scope, provides a visual picture of the complete ignition system of an engine. Either battery or magneto operated systems may be tested. The device may be operated by 110-volt current or off an automobile battery. No power pack is required. Handling 6, 12, or 24 volt systems, the analyzer shows the firing cycle of any single cylinder, all 4, 6, or 8 at once, or parades one after the other.

The electrical performance of the entire circuit may be observed on the analyzer while the engine is running.



Complete, instantaneous analysis may be obtained of the dwell or cam angle, breaker point operation, distributor wear, condenser action, primary circuit leakage, spark plug action, secondary circuit resistance, secondary circuit insulation, ignition reserve and valve action. The easy to read trace pattern amplifies either horizontally or vertically on the large 5-in. tube.

The unit is light in weight and portable. It comes complete with a power timing light and a full set of spark plug adaptors. *Snap-On-Tools Corporation, Dept. RLC, 8028 28th Ave., Kenosha, Wis.*

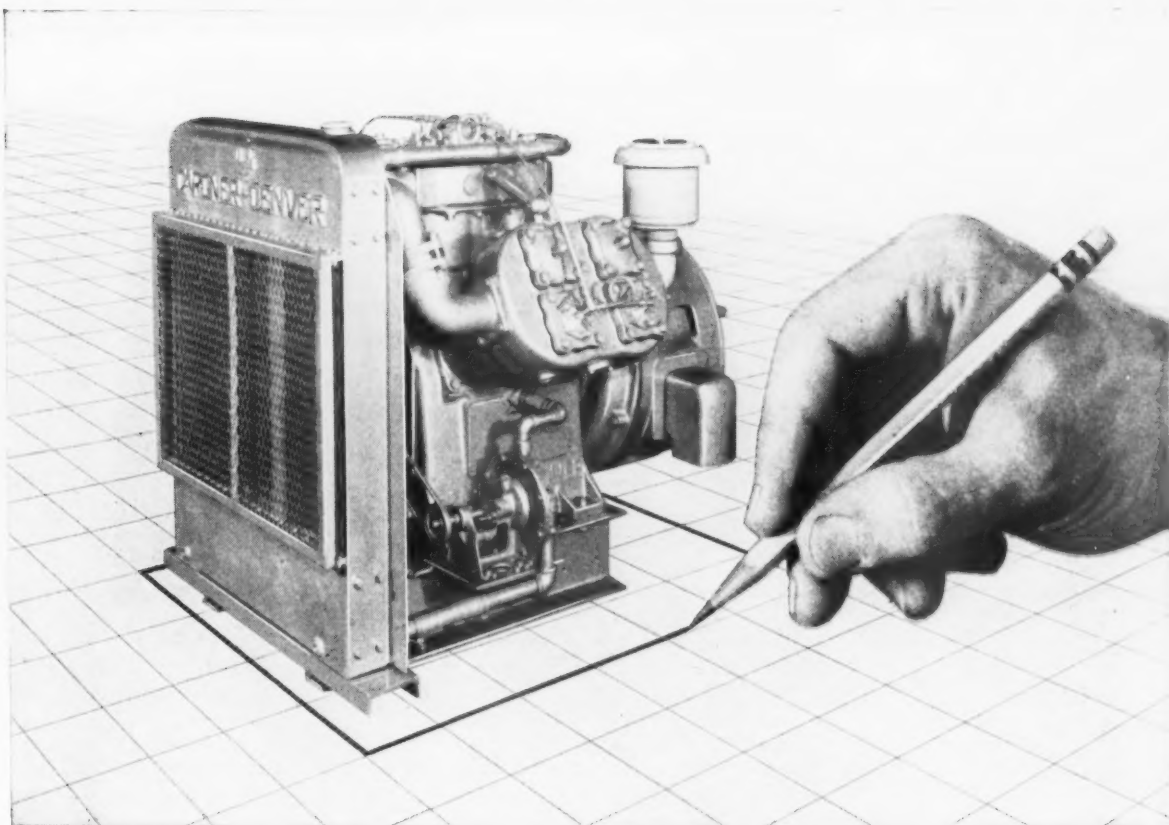


### Automatic Tongs

With these heavy-duty automatic tongs, railroad wheel and axle assemblies weighing up to 3,500 lb each can be lifted quickly and easily. The tongs have a maximum jaw opening of 9 in. for fitting around an axle. Two pairs of jaws, 18 in. apart are controlled by a single automatic locking unit on the spreader bars.

The tongs are suspended from a crane with a long boom mounted on a four-wheel truck, and lowered over an axle with its jaws locked open. Lowering them a few additional inches to create slack releases the automatic locking mechanism, so that when the tongs are raised they close against the axle. The load, while it is in the air, cannot be released. *Heppenstall Company, Dept. RLC, Fifth ave and 16th st, New Brighton, Pa.*

(Turn to page 88)

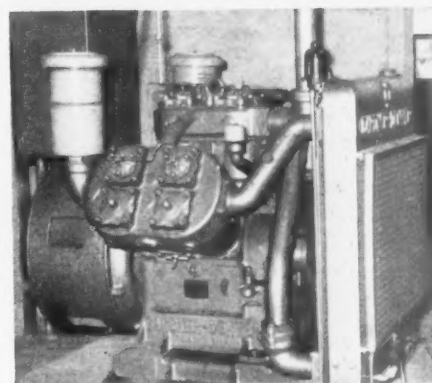


## SPACE PROBLEM?

*These compressors can help solve it*

With space around car and engine shops always at a premium, you can't afford to "bottle it up." Here is a compact source of air power you don't have to scratch your head to find a place for—a Gardner-Denver WB. You can get 686 c.f.m. in a 67" x 67" space. Take a look at the specifications:

Length	Width	Motor H.P.	Model
39"	47"	25	WBR
40"	52"	40	WBE
49"	52"	50	WBQ
56"	56"	75	WBH
67"	67"	100	WBK
67"	67"	125	WBJ
72"	68"	200	WBN



Gardner-Denver WB. Needs no special base—just bolt down, hook up and you have a steady, dependable source of air.

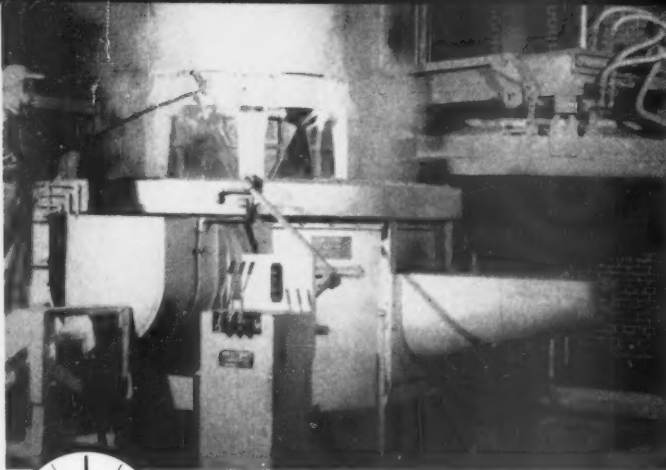


ENGINEERING FORESIGHT—PROVED ON THE JOB  
IN GENERAL INDUSTRY, CONSTRUCTION, PETROLEUM AND MINING

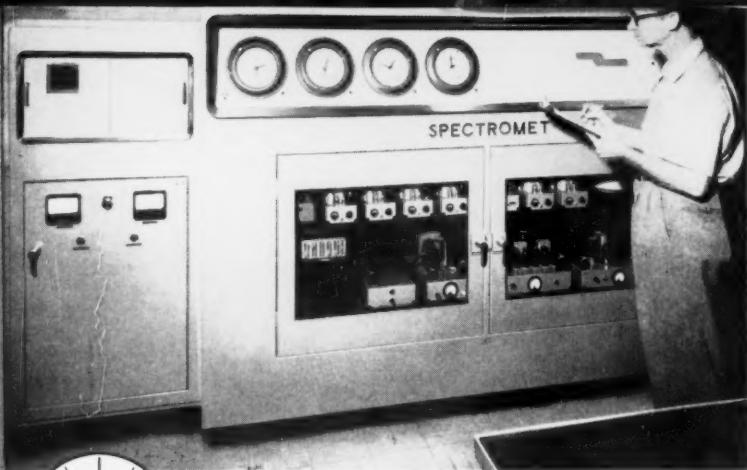
# GARDNER - DENVER

Gardner-Denver Company, Quincy, Illinois

IN CANADA: GARDNER-DENVER COMPANY, (CANADA), LTD.  
14 CURITY AVENUE, TORONTO 16. ONTARIO



**9:00 a.m. Charge!** With an air-splitting roar the electric furnace swallows the rigidly selected steel scrap, and the electrodes take their bite. In order to obtain Southern wheel's unique carbon steel, with its precise blend of alloying elements, the charging mixture must be an exact balance of selected and weighed materials. Now the strict timetable of quality control begins . . .



**10:40 a.m. Rapid steel analysis.** Less than two hours after charging the furnace, the last analysis of alloying elements in the molten metal is made on a direct reading spectrometer. Finished in a matter of minutes (as compared to older methods that required several hours) the analysis is rushed by air tube to the metallurgical control engineer, and the steel is ready to . . .

from steel scrap

to rolling wheel

A Tough Timetable



**10:59 a.m. Cast!** The mechanized conveyor moves the molds into position and the steel is poured. There is a hiss of flame and flung spark as the metal hits the mold cavity. Made on highly automatic equipment, these molds are engineered to utilize the strength of cast steel to the utmost. Slowly cooling, the wheel molds move on to shake-out and . . .

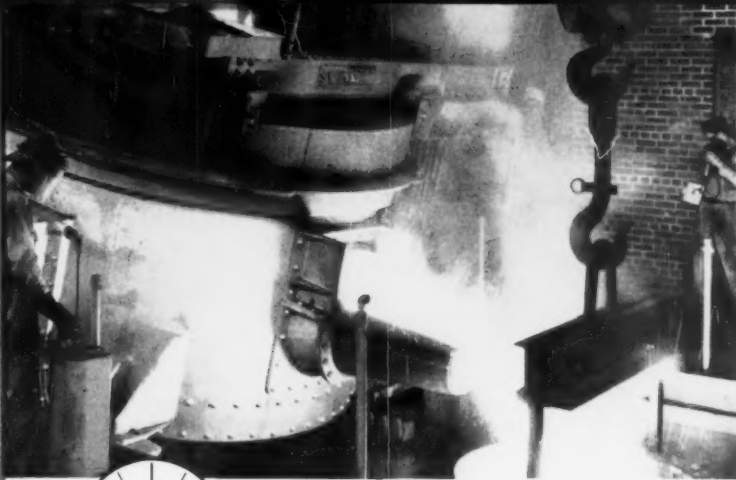
*rigidly timed quality control packs more value  
in Southern® cast steel wheels*

Casting quality into Southern steel wheels — quality that means more value for the dollar — is a dramatic, almost split-second job. From the moment the carefully selected scrap hits the electric furnace to the precision machining of the hub and tread, skilled experts commanding a battery of

electronic measuring equipment call the shots in this exciting casting story.

Result? Freight service wheels of uniform quality that consistently roll farther and cost less — *Southern cast steel wheels.*

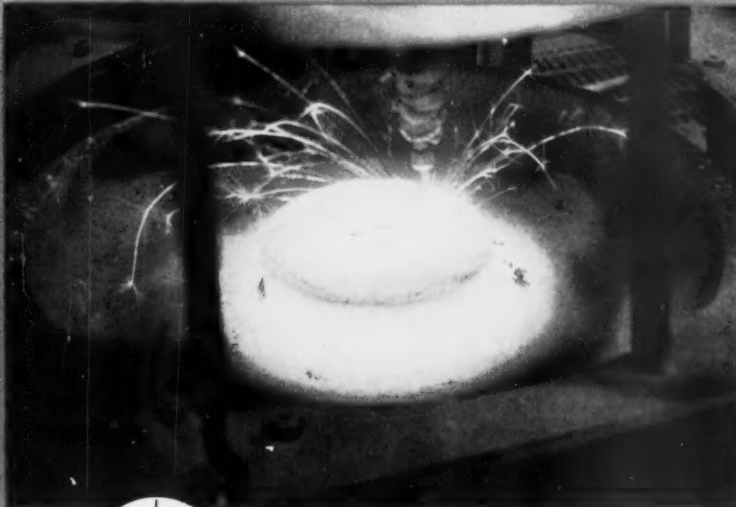




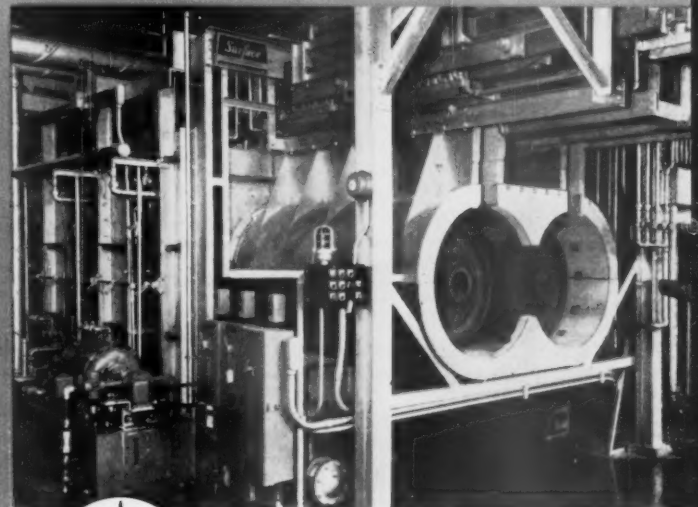
**10:45 a.m. Pour!** The furnace tips and white hot metal thunders into the reservoir ladle. The timing is growing more delicate as the seconds pass, for once out of the furnace, the steel begins to cool. Under the ever-watchful pyrometer of the metallurgical control engineer, who keeps a careful record of time and temperature, the steel is transferred at the right moment to the pouring ladles, to await the . . .



**10:58 a.m. Approach to casting temperature.** The metallurgical control engineer watches the moving temperature graph of the thermocouples that have been dipped in the pouring ladles. Southern cast steel wheels are cast only when the molten steel is within a very narrow range of temperature. This is one of the secrets of Southern wheel quality. At the right moment the wheels are . . .



**12:07 p.m. Rough cut of hub.** The conveying system is carefully timed to bring the wheel to the next critical step: rough cut of the hub. An oxy-acetylene torch smoothly and automatically slices out a glowing cylinder of metal from the wheel's center in minimum time. In this way heat effects are eliminated. After slow and carefully timed cooling in the annealing pits . . .



**7:00 p.m. Heat treatment.** The wheels are moved to the two-stage, heat-treating furnaces. Here they are given an electronically controlled heat treatment that lasts about 16 hours, insuring a refined grain structure and exceptional toughness. The wheels are then shot-blasted, inspected and ready for . . .



**Precision machining.** The cast steel wheels are machined at a single chucking on special automatic vertical turret lathes, insuring dimensional accuracy and true concentricity. All that remains now is final inspection and the wheels are off to their job of providing the railroads with more value for the dollar.

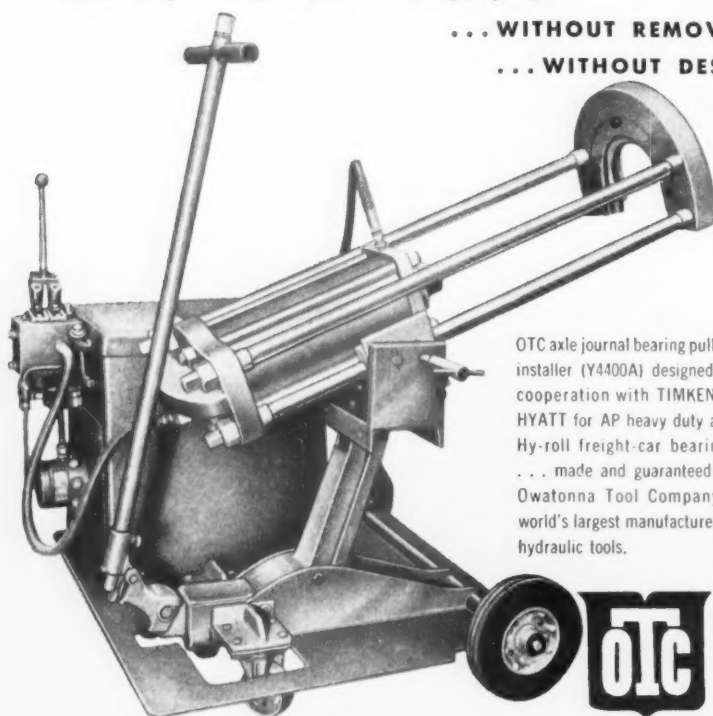
AMERICAN  
**Brake Shoe**  
COMPANY

RAILROAD PRODUCTS DIVISION  
530 Fifth Avenue • New York 36, N. Y.



# NOW—ONE MAN ... can pull, install axle journal bearings IN MINUTES...

...WITHOUT REMOVING CAR WHEELS  
...WITHOUT DESTROYING WHEEL FIT



OTC axle journal bearing puller-installer (Y4400A) designed in cooperation with TIMKEN & HYATT for AP heavy duty and Hy-roll freight-car bearings ... made and guaranteed by Owatonna Tool Company—world's largest manufacturer of hydraulic tools.

Slash manhours—slash labor costs—slash lost time—with this new OTC journal-bearing puller-installer. One man has 74 tons hydraulic pressure on tap—muscle aplenty to remove even stubborn "frozen" bearings—and 53 tons pressure to press home the tightest fit.

Entirely self-contained, this OTC puller-installer rolls to the job on large wheels (two swiveling). Puller frame raises or lowers hydraulically to the right height, tilts to fit over axle-bearing assembly.

Puller-installer is complete with OTC double-acting ram, 2-horsepower electric motor, piston-type pump, 2-gallon hydraulic reservoir, 3-way hydraulic control valve, pressure gage, hydraulic lift for raising and lowering tiltable puller frame.

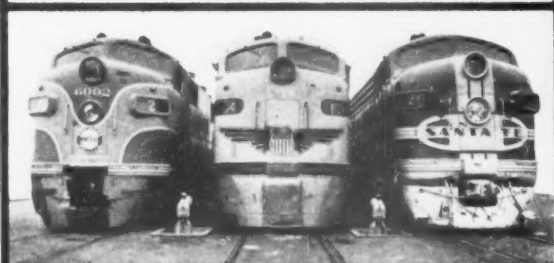
Complete details in OTC bulletin HYRR 57—see your OTC representative or write



**OWATONNA TOOL COMPANY**

495 CEDAR STREET  
OWATONNA, MINNESOTA

## THREE LOCOMOTIVES in California Rendezvous



### ...all equipped with SPRAGUE AIR-PUSH Windshield Wipers!

Locomotives of three railroads approaching camera on parallel tracks in Los Angeles recently in observance of "Invest in America Week." They are (from left) Southern Pacific, Union Pacific, and Santa Fe. All three are equipped with Sprague Air-Push Windshield Wiping Equipment, as are 95% of all modern diesel locomotives!

**Sprague** DEVICES, INC.  
MICHIGAN CITY, INDIANA

## America's foremost engineered lettering tools

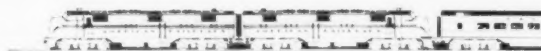
designed to reduce  
your present costs

**50 to 80%**

Used today by 1/3rd of the  
Nation's leading Railroads...



*Spray it—*  
**STENCILS**  
PRESSURE SENSITIVE TYPES



Easy to apply. No skill required. Produces the most accurate and durable type of lettering, numerals, medalion, and other types of markings. Adds long life to your identification or advertising on all your equipment...



Whatever your lettering problems may be regarding identification, advertising, reflective or non-reflective, the DEMP-NOCK LETTERING SYSTEMS can help you get the job done in less time.

For additional information write Dept. RR-100  
**THE DEMP-NOCK COMPANY**

31433 MOUND ROAD • VAN DYKE, MICHIGAN • U.S.A.



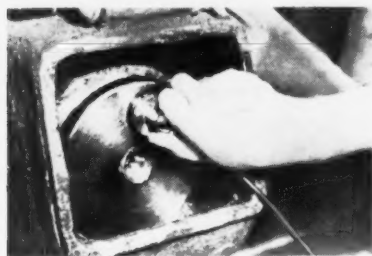


HELPING TO KEEP YOUR ROLLING STOCK SAFE

## TEST 320 FREIGHT CAR AXLES A DAY AT 8.2 CENTS AVERAGE COST PER JOURNAL

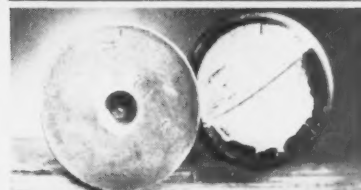
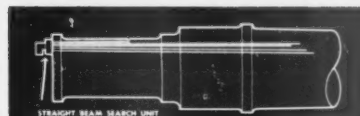


Sperry Journal Test Cars in use on one of the country's leading railroads have achieved these results over more than a year's operations. Other accomplishments are equally impressive. Through January 1957, a total of 153,198 freight cars were checked. On these cars 328 cracked and defective axles were discovered. Findings to date average one faulty axle for every 467 cars inspected.



The Sperry Journal Test Car provides for fast, simple and positive journal testing. The operator drives the Test Car easily and rapidly alongside freight cars on the track; testing is done without leaving the car and one operator can check up to 80 cars daily.

### HOW TO "DRIVE-TEST" WITH REFLECTOSCOPE®



DEFECTIVE

GOOD

The search unit, placed on the end of a freight car journal, beams ultrasonic sound waves through the axle. Any defect, crack or flaw in the journal interrupts the sound beams and sends its reflection back to the Reflectoscope, where it is pictured on a cathode ray tube. The sketch shows an axle defect and its picture on the tube, which is mounted directly in front of the driver's seat.

Mechanical Departments gain benefits in time, labor and money from this speedy, sure method of journal testing. Your Sperry Sales Engineer will be glad to give you the complete details. If you wish, we will send you literature.



### SPERRY RAIL SERVICE

Division of Sperry Products, Inc. • Danbury, Connecticut  
Supplying Railroads Exclusively

New York, N. Y., 60 East 42nd St. • Chicago, Ill., 80 East Jackson Blvd. • St. Louis, Mo., 818 Olive St.





# most service per dollar

Low cost and high quality go hand in hand in today's chilled wheel and give you a maximum of service for a minimum investment.

## want good performance?

Association chilled car wheels have an excellent over-all safety record in freight car service. According to ICC records the safety curve goes steadily upward.

## want economy?

Association wheels are low in first cost, high in exchange value, and permit lower inventories because they are available on short notice from nearby Association plants.

The wheel to use, if you want a *combination* of quality performance and economy, is the Association chilled car wheel.

in good supply  
available locally  
short-haul delivery  
reduced inventory  
low first cost  
low exchange cost  
increased ton mileage  
high safety standards  
plant inspection  
easier shop handling

## RAILWAY WHEEL ASSOCIATION

(Formerly Association of Manufacturers of Chilled Car Wheels)

445 North Sacramento Boulevard, Chicago 12, Ill. • Albany Car Wheel Co.  
ACF Industries • Griffin Wheel Co. • Marshall Car Wheel & Foundry Co.  
Pullman-Standard Car Mfg. Co. • Railroad Products Div., American Brake  
Shoe Co. • Canada Iron Foundries, Ltd. • Canadian Car & Foundry Co., Ltd.



# 3 reasons why **M·F** Water-Tight bolts make *BETTER FLOORS*

① smooth ..... BECAUSE THEY'RE **flat**

② clean .... BECAUSE THEY'RE **flush**

③ dry ..... BECAUSE THEY'RE **tight**

Shippers want safe delivery, not damage claims. A flat, flush, dry surface ensures lading protection. And, because M·F Water-Tight bolts require no countersinking, their added protection costs less to start with!

The M·F Water-tight ring prevents the entrance of moisture and decay, too — reduces flooring maintenance.

SAVE LADING . . . SAVE LABOR . . .  
SAVE FLOORING with M·F WATER-TIGHT BOLTS.

**M**aintenance

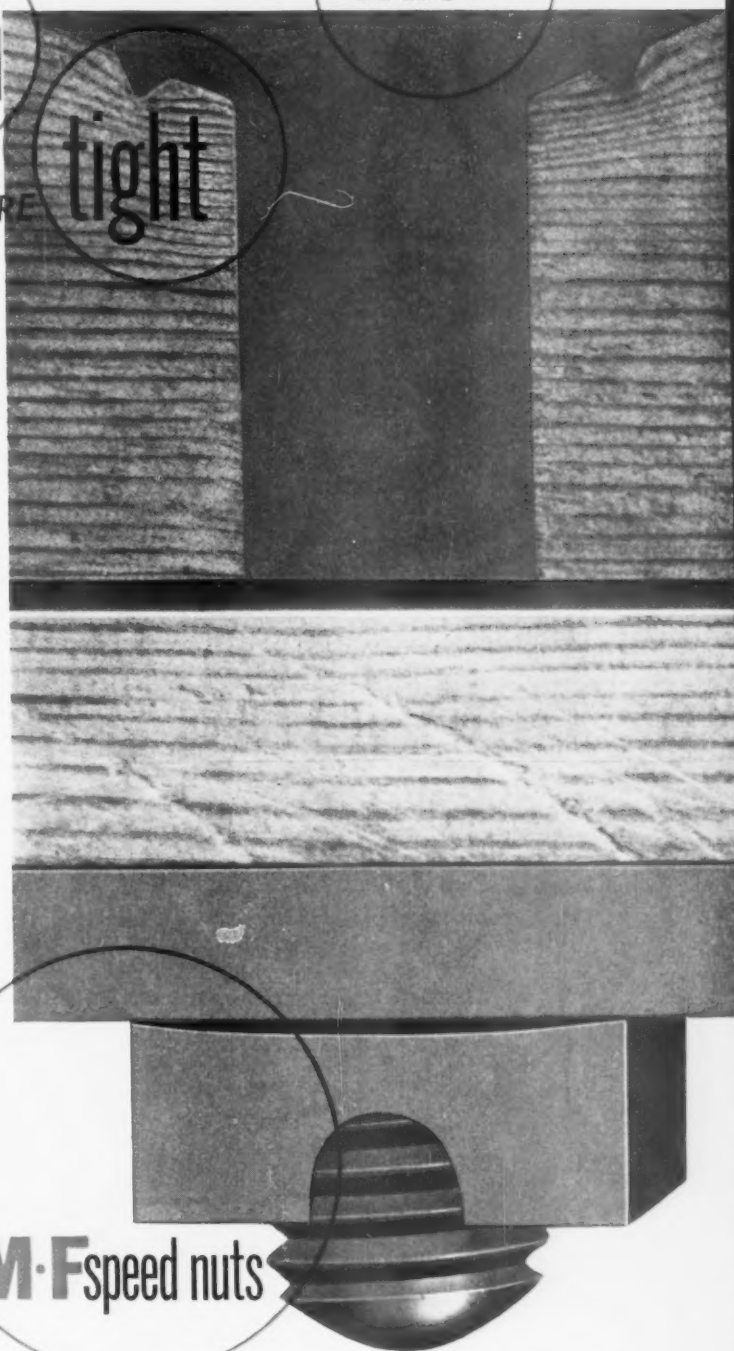
**F**ree BECAUSE THEY'RE LOCKED WITH

**M·F** speed nuts

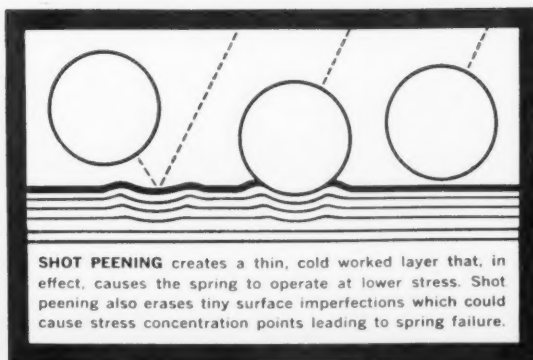


In Canada: The Holden Co., Ltd., Montreal

MACLEAN-FOGG LOCK NUT COMPANY  
5535 N. Wolcott Ave., Chicago 40, Ill.



*made stronger to last longer*



## Crucible *fatigue-resistant* springs

### cut bad-order car expense

You can help keep cars off the repair tracks with Crucible's *fatigue-resistant* springs. They're single heat treated and shot peened — *made stronger to last longer* — yet they cost no more than conventional springs.

Because they last longer, Crucible *fatigue-resistant* springs reduce replacements due to spring failures—90% of which are caused by permanent set.

**Fatigue-resistant** springs can maintain their load-carrying capacities over longer periods because they have better

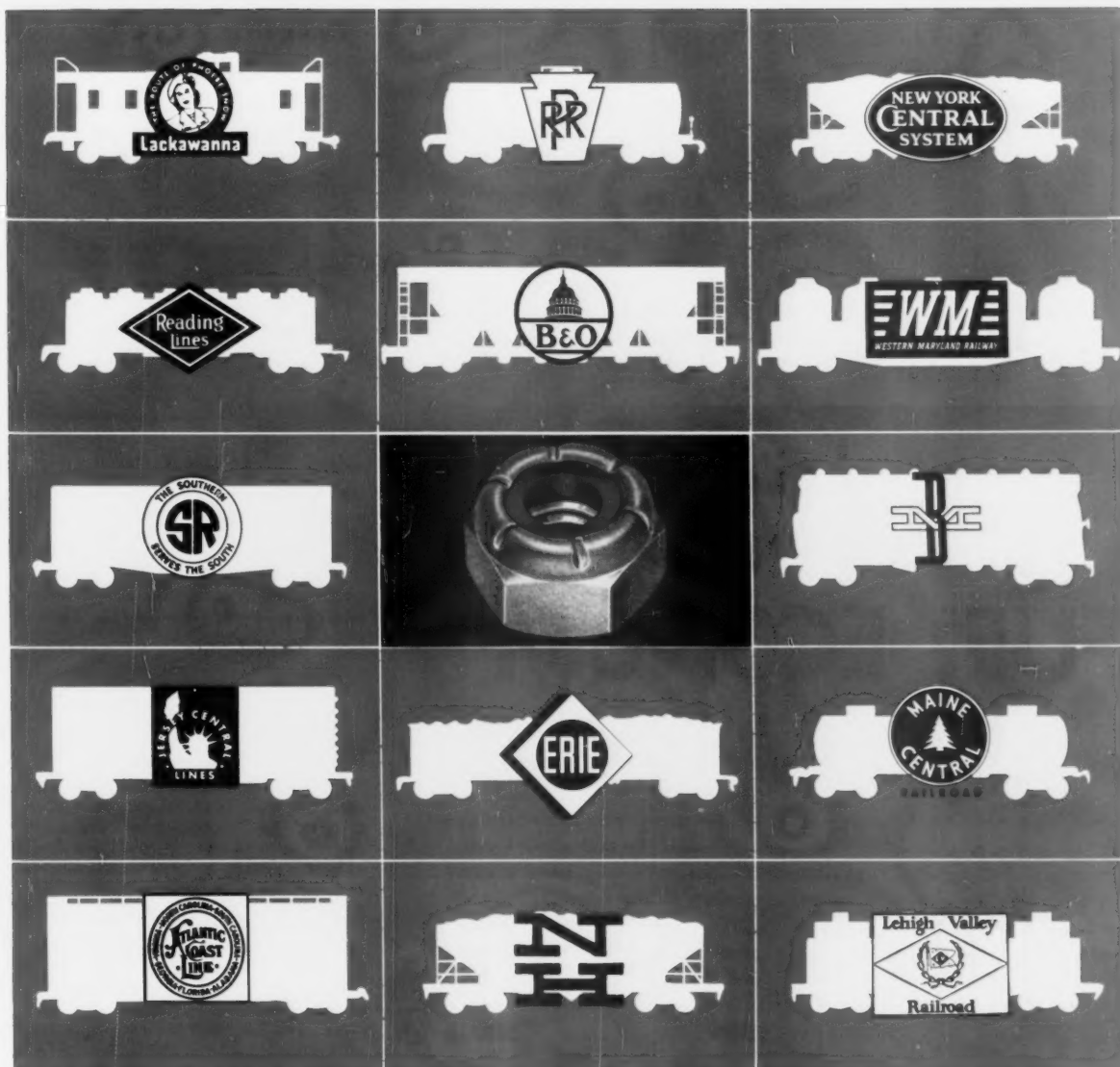
hardenability, higher elastic limits and greater resistance to working stresses. Crucible ensures these qualities in every spring through strict manufacturing control from ore through final, rigorous compression tests.

Crucible single heat treated *fatigue-resistant* springs are your best guarantee of low-cost, long-lasting spring performance. For details, write for folder: *Spring Division, Crucible Steel Company of America, McCandless Avenue, Pittsburgh 1, Pa.*

**CRUCIBLE**

spring division

**Crucible Steel Company of America**



## TEAMED UP TO WITHSTAND THE EFFECTS OF VIBRATION

These outstanding railroads and the builders of the cars they use are upgrading their requirements for vibration resistance and safety in freight cars. The stresses of today's high speed diesel operations demand it. Elastic Stop® nuts are being specified in many areas because they will not loosen under the vibrations set up in high speed operations. Association of American Railroads Rule 101 recognizes this with the following: "Elastic Stop nuts applied are chargeable on the basis of Rule 105 when standard to car." Thus, this rule calls for the replacement of Elastic Stop nuts with Elastic Stop nuts.

This is important because Elastic Stop nuts reduce cost of maintenance and inspection to a minimum.

For details of the how . . . where . . . and why of Elastic Stop nut application to freight car vibration and maintenance reduction, write Dept. N35-1128.



**ELASTIC STOP NUT CORPORATION  
OF AMERICA**

2330 Vauxhall Road, Union, New Jersey

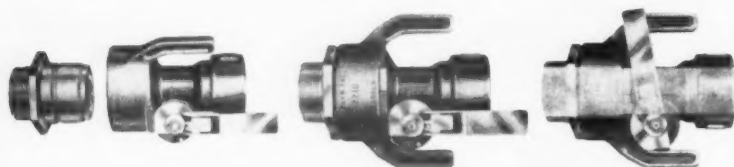


# every drip means a drop in **FUEL ECONOMY**

## STOP WASTE . . . Specify the New Roylyn "NON-SPILL" Fueling Valve

Actual road tests have proved that less than a spoonful of fuel is wasted during each fueling operation with Roylyn equipment... just a drop in the bucket when you consider the oil-soaked loading areas of the past.

Unnecessary drippage and spillage of diesel oil on and about loading facilities have long been a costly problem to the railroads... AND, a fire, accident and disposal problem to both the railroads and the communities served.



FOOLPROOF AND FREE-FLOW OPERATION... (1) Prior to engagement (2) Engaged with Valve Closed (3) Valve Open and Clear Fuel Flowing.

### Here's What This Equipment Will Do For You . . .

- ELIMINATE SPILLAGE OF FUEL
- LOWER MAINTENANCE COSTS
- LOWER EQUIPMENT COSTS
- REDUCE FIRE AND ACCIDENT HAZARDS
- MINIMIZE FACILITY CONTAMINATION
- IMPROVE PUBLIC RELATIONS



Write for your copy of Brochure fully describing Roylyn's "Non-Spill" Coupling-Valve!

**AIRATERRA**

620 Paula Avenue • Glendale 1, California  
Chapman 5-1196 • Citrus 2-1146 • TWX 7158 WUX



### FOR RELIABILITY... SPECIFY ROYLYN RAILROAD PRODUCTS

U. S. Sales Representative: Equipment Research Corp. Canadian Representative: Anthony Foster & Sons, Ltd.  
64 East Jackson Blvd. 294 Church Street  
Chicago 4, Illinois Toronto, Ontario, Canada

## What's New

(Continued from page 78)



### Stud Welding Gun

This NS-10 stud welding gun is 9 in. long and weighs approximately 4 lb—about a third less than earlier units. It is balanced for easy handling and will weld all studs up through 1/2 in. diameter. Nelson Stud Welding Division, Gregory Industries, Inc., Dept. RLC, Lorain, Ohio.

### Cargo Heater

This Model TH-11 cargo heater which complies with ICC regulations and is designed for protection of perishable shipments, produces up to 11,000 Btu's of heat per hour. It burns methyl alcohol and is thermostatically controlled to produce temperatures from 30 to 70 deg F. It will burn for 30 hr on full flame without refuelling. It is said to be free from any poisonous gas or fumes that might damage produce or humans, requires no outside venting, is explosion-proof, and has built-in tip over safety valves. Presco Incorporated, Dept. RLC, 6300 E. Slauson ave., Los Angeles 22, Cal.

## Supply Trade Notes

L-O-F GLASS FIBERS COMPANY, CORRULUX DIVISION.—Gordon E. Walls has been appointed northeast regional sales manager, at New York. Three new district sales managers are: William G. Catchcart, Jr., at Chicago; Fred A. Laake, Jr., at Dayton, Ohio; and Henry B. Selby, at Charlotte, N. C.

CRUCIBLE STEEL COMPANY OF AMERICA.—John J. Bollinger has been appointed sales representative, midwest-  
(Continued on page 92)



# ✕ WABCO® ✕ Packing Cups take the punch and bounce back

The ability of Wabco composition to bounce back and regain its original contour after deflection has made it amazingly successful in air brake packing cups, as well as seals and gaskets. It is this unmatched resiliency that has reduced brake system leakage to a previously unattainable minimum. It made it possible to extend maintenance intervals because of the longer service life.

To maintain top performance, be sure to use genuine Wabco parts. Specify them by name. Each Wabco Packing Cup carries the trade-mark, date of manufacture, mold number and piece number. Thus you can order and get the same high-quality parts time after time.

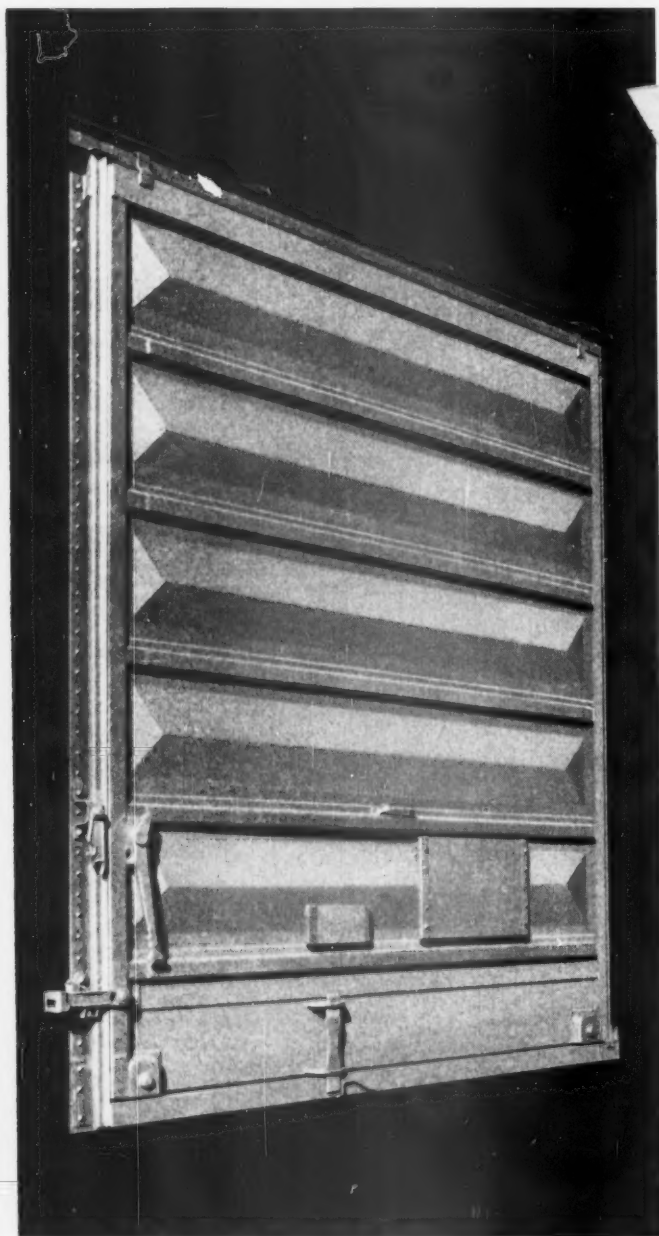


Westinghouse Air Brake  
COMPANY

AIR BRAKE DIVISION ✕ WILMERDING, PENNA.

✕ WABCO ✕ **Dated** Packing Cups

# P-S Box Car Side Doors



**This booklet will  
give you the facts  
...write for it**

Every pertinent fact regarding operating characteristics, strength and durability, maintenance ease and simplicity, lading protection qualities and laboratory and service testing of the P-S Box Car Side Door is included in this to-the-point booklet. Write for a copy now . . . study it . . . compare this door to any on the market. And when you do, no matter what comparisons you make—economy, durability, lading protection—you'll find the Pullman-Standard Box Car Side Door offers the best value to your railroad.

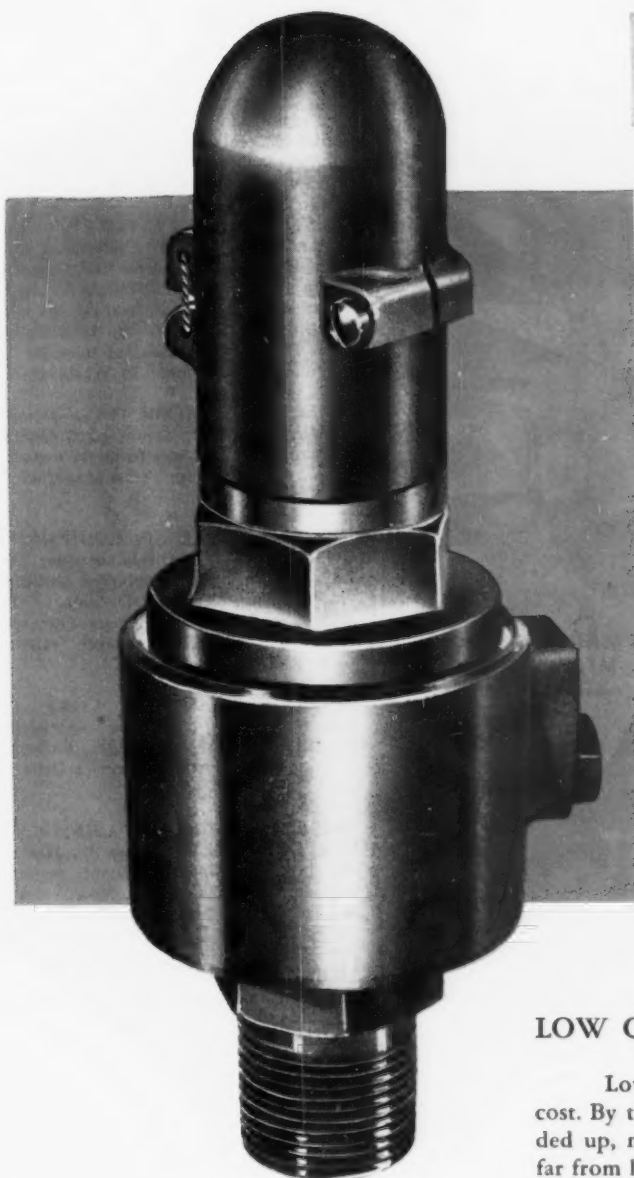
WORLD'S LARGEST BUILDER OF ROLLING STOCK

## PULLMAN-STANDARD

CAR MANUFACTURING COMPANY

221 NORTH LA SALLE STREET, CHICAGO 1, ILLINOIS  
BIRMINGHAM, PITTSBURGH, NEW YORK, SAN FRANCISCO





## THE NEWEST CONCEPT IN SAFETY VALVES

### LOW COST RESERVOIR SAFETY VALVES

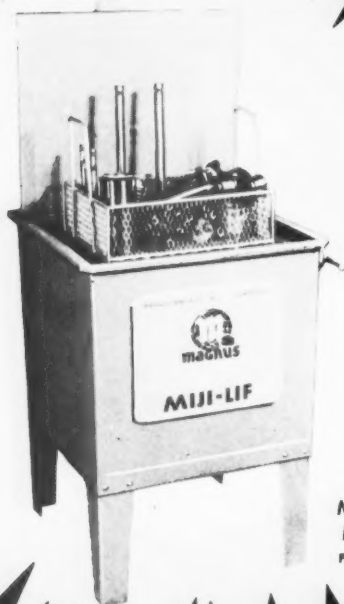
Low initial cost does not necessarily mean low overall cost. By the time installation and maintenance costs are added up, many a "bargain" valve turns out to be something far from low cost. The J-1 main reservoir safety valve is low cost *all the way* . . . low initial cost . . . low installation cost . . . low maintenance cost.

In the atmosphere of compressed air and oil vapors common in diesel-electric locomotives, the J-1 safety valve is not subject to galling and sticking caused by deposits as are other valves. The most economical reservoir safety valve you can specify for new equipment, The New York Air Brake Company's J-1 safety valve is also the best for replacement part application. The wide range of pressure settings (85 psi to 225 psi) makes the J-1 easily adaptable to the requirements of equipment already in service on your road.

THE NEW YORK AIR BRAKE COMPANY  
230 PARK AVENUE • NEW YORK 17, N. Y.



# ANNOUNCING



**MAGNUS  
MIJI LIF**  
Patents Pending

## NEW, LOW-COST AGITATING CLEANING MACHINE!

... Puts the proven advantages of mechanically agitated cleaning within reach of every railroad shop.

Specifically designed to provide low-cost agitating cleaning of small parts (such as maintenance-of-way equipment, signals, air brakes, injectors and governors, etc.), this new development by the inventors and creators of the Magnus Aja Lif Cleaning Machine offers:

- ★ **DUAL AGITATION**—of parts and liquid, for fast, thorough economical cleaning.
- ★ **AIR OPERATION**—for easy installation and safe, sturdy operation.
- ★ **BATTLESHIP CONSTRUCTION**—or lasting 14 gauge sheet steel.
- ★ **75 POUND CAPACITY**—21" x 18" platform.
- ★ **SINGLE LEVER OPERATION**—to raise or lower work automatically.

*Write today* for free information to Magnus,  
77 South Avenue, Garwood, New Jersey.



**RAILROAD DIVISION  
MAGNUS CHEMICAL CO., INC.**

—a world-wide organization specializing in cleaning and protection of all surfaces.

### Supply Trade Notes

(Continued from page 88)

ern region, for the Spring Division of Crucible Steel at Chicago. He was formerly manager of employee relations, Pittsburgh.

■ **WESTINGHOUSE ELECTRIC CORPORATION.**—*Fred E. Everett* has been named manager of marine and transportation section, East Pittsburgh, Pa., with responsibility for coordinating sales of Westinghouse products to these industries. He has been assistant manager of the marine department in Washington.

■ **AMERICAN PAMCOR, INC.**—*Donald F. Miersch* has been appointed as general sales manager. He was formerly consultant on marketing for Avco Manufacturing Corporation.

■ **INTERNATIONAL EQUIPMENT COMPANY.**—*T.T. Arnold*, manager, railway sales, has been appointed assistant vice-president, Railway Division. *D.D. Richardson*, sales and service engineer, has been appointed manager, railway sales, Railway Division.

■ **COLLINS & AIKMAN CORP.**—*C. Russell Warren* appointed\* to newly created post of sales manager, Railroad Division, Transportation Fabrics Department.

■ **KAISER ALUMINUM & CHEMICAL CORPORATION.**—*Clarence W. Higbee* has been appointed assistant general manager, and *Gillette N. Houck*, sales manager of the newly established Electrical Conductor Division.

■ **AMERICAN STEEL FOUNDRIES.**—ASF has announced plans for constructing and equipping a second Canadian plant in Transcona, Man., for the manufacture of EQS cast-steel wheels for freight cars. The plant will be operated by Griffin Steel Foundries Ltd., a subsidiary of ASF at St. Hyacinthe, Que. The Transcona plant will be patterned after the two new plants of the Griffin Wheel Company in Chicago and Colton, Cal., and will have a capacity of approximately 100,000 wheels a year. Operation is expected to begin during the latter part of 1958.

■ **SIMMONS-BOARDMAN PUBLISHING CORPORATION**—Simmons-Boardman has opened two new district sales offices, one in Philadelphia and one in Pittsburgh, to provide intensified service to the railway supply industry. The Philadelphia office in charge of *W. E. Glashy*, newly appointed district manager, at Jericho Manor, Jenkintown, telephone: TUrner 7-4526. The Pittsburgh office is in charge of *C. J. Fisher*, newly appointed district manager there, at 530 Sixth avenue, telephone: GRant 1-8186. These and other district sales offices for Railway Locomotives and Cars and its affiliated monthly publications are listed on page 5.

(Continued on page 94)



BARBER  
STABILIZED  
TRUCKS  
are  
easier  
to  
service

**STANDARD CAR TRUCK COMPANY**, 332 S. Michigan Ave., Chicago 4, Illinois.

*In Canada: Consolidated Equipment Co., Ltd., Montreal 2.*

# A Working Guide to LOW-COST END RESULTS



For *real* railroad cleaning economy you must have *man-hour* economy, too. So look to the speed and thoroughness with which a man cleans when using the best materials... and at the *methods* which can save endless hours of work.

This new booklet gives you a good look at eight important groups of jobs where you can profit from Oakite railroad cleaning experience, research done especially for railroads, and high quality

materials engineered for specific problems. You'll see valuable information on cleaning exteriors, interiors, running gear and trucks, parts, cooling system maintenance and many more jobs.

Send for this booklet without obligation. Find out why most railroad men rely on Oakite cleaning as the standard for maintenance operations. Write OAKITE PRODUCTS, INC., 46 Rector Street, N. Y. 6, N. Y.



... gives you the important advantage  
**LOW-COST END RESULTS**

Export Division Cable Address: Oakite

**RAILROAD DIVISION**

## Supply Trade Notes

(Continued from page 92)



R. D. Hitt



S. J. Rejda

**AEROQUIP CORPORATION.**—Richard D. Hitt has been appointed manager, railroad sales, at Jackson, Mich. Mr. Hitt was formerly industrial sales engineer in Pennsylvania.

**EPOXY COIL CORPORATION.**—The Epoxy Coil Corporation, 11510 South Alameda street, Los Angeles 59, has been organized to manufacture and supply a new type of traction motor field and armature insulation. Both new Epoxylite molded coils and maintenance kits, developed to repair vibration-damaged coils without rewinding, will be distributed through the Transcrip Corporation, Chicago. S. J. Rejda is president of the new company and Dr. Henry Lee, engineering vice-president.

**AMERICAN BOSCH ARMA CORPORATION.**—American Bosch has purchased Hydramotive Inc. of Cleveland, Ohio, which company has developed the Hydrotor, a hydraulic starter for all types of diesel and gasoline engines.

**GOULD-NATIONAL BATTERIES, INC.**—Richard Relf, Cleveland district manager, has been appointed Detroit regional sales manager, Industrial Division.

**CONTINENTAL DIAMOND FIBRE OF CANADA LIMITED.**—This is the new name of the Diamond State Fibre Company of Canada Ltd.

**FAIRBANKS, MORSE & CO.**—W. B. Morse has been appointed manager of the Chicago branch. W. F. Wahlenmaier, manager of the Portland branch, has been appointed manager of the New Orleans branch, succeeding Page S. Proctor, who retires January 1. Milo C. Roy succeeds Mr. Wahlenmaier.

**AIR REDUCTION SALES COMPANY.**—H.C. Wallace, assistant regional sales manager, Southern Region, has been appointed regional sales manager of that region, with headquarters at Houston, Tex., succeeding M.G. Wicker, resigned. A.W. Gilpin, has been appointed assistant to the regional sales manager at Houston, and R. Pringle succeeds Mr. Gilpin as assistant sales manager.

(Continued on page 98)

## Books . . . for the railroader

### DIESEL-ELECTRIC LOCOMOTIVE HANDBOOK



#### MECHANICAL EQUIPMENT; ELECTRICAL EQUIPMENT

by George F. McGowan

The basic reference book for enginemen, maintenance men and other railroad personnel concerned with the operation and maintenance of diesel-electric locomotives. An excellent ready-reference. Save time — solve problems — make the job easier.

#### In Two Convenient Volumes

**Electrical Equipment**—Complete coverage. Requires no preliminary study of the subject. Explains electrical equipment in diesel-electric locomotives from the ground up. Full descriptions of all major pieces of equipment, their parts, construction, operation, care and repair.

**Contents:** The Electric Transmission. Electrical Fundamentals. The Electric Generator. The Traction Motor. Exciters, Auxiliary Generators, Motor Blowers, Dynamic Braking, Batteries, Contactors, Electro-Motive Division Electrical Equipment. Alco-General Electric Electrical Equipment. Lima-Hamilton Locomotive Electrical Equipment. Baldwin Locomotive Electrical Equipment. Fairbanks-Morse Electrical Equipment.

xii, 290 pages, 120 illustrations, cloth, \$2.75

**Mechanical Equipment**—Authoritative and clearly written in easy to understand language, this volume covers diesel-electric locomotive construction, design, proper operating methods, "trouble-shooting," and effective servicing and maintenance.

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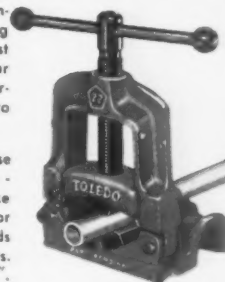
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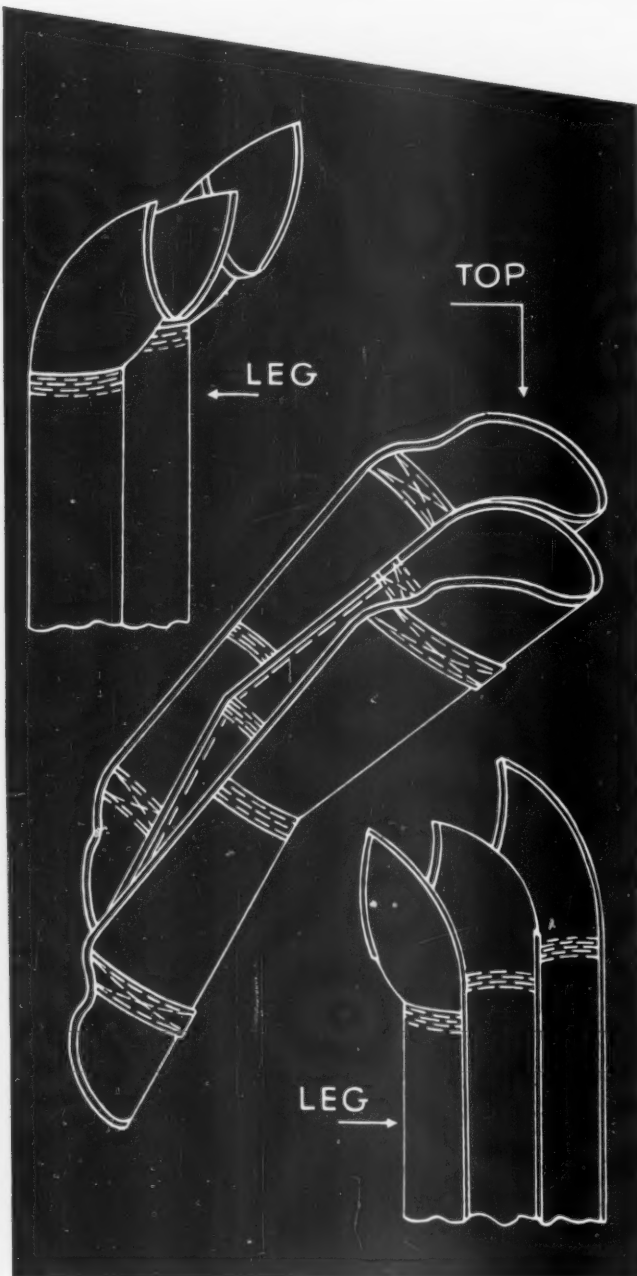
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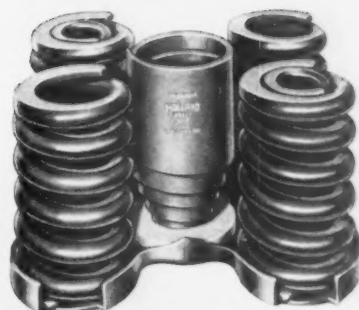




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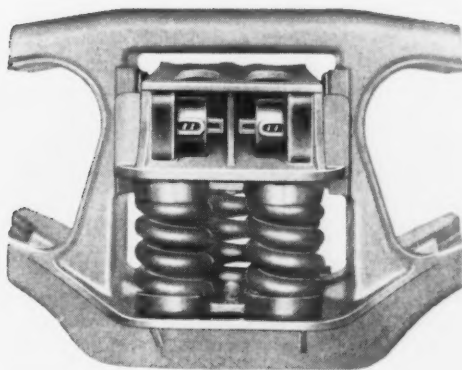
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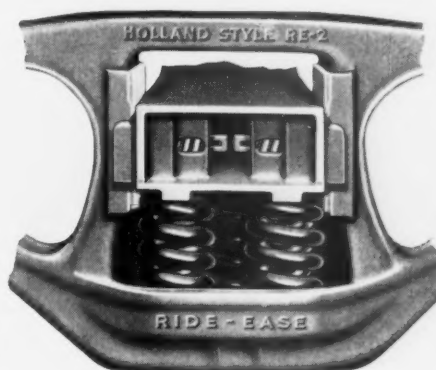


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### Supply Trade Notes

(Continued from page 94)

**THOR POWER TOOL COMPANY.**—James P. Stine, East Coast zone manager, has been promoted to manager of the New York branch, succeeding W. J. McGraw, recently named manager of Thor's electric tool division. A. V. Moroz has been appointed electric tool sales manager, Chicago branch, succeeding Arthur H. Nelson, retired.

**WAUKESHA MOTOR COMPANY.**—Newton H. Willis, recently named a vice-president, has been placed in charge of the company's engineering activities. He will continue to direct the railway division.

## HELPS FROM MANUFACTURERS

The following compilation of literature—including pamphlets and data sheets—is offered free to railroad men by manufacturers to the railroad industry. To receive the desired information write direct to the manufacturer.

**BATTERIES.** Revised 44-page "Battery Users Manual" describes complete scope of motive-power battery maintenance and repair. Specially designed for conducting organized battery in-plant training courses. Includes illustrations, diagrams, and tables on battery theory and construction, battery selection, battery testing and techniques, etc. (Write: Gould-National Batteries, Inc., Dept. RLC, Trenton 7, N. J.)

**HYDRAULIC CRANE.** 4-page Gould Report No. 5609 discusses use and cost of operating A-W hydraulic three-in-one crane in a Pullman-Standard car-building plant. (Write: Austin-Western Works, Baldwin-Lima-Hamilton, Dept. RLC, Aurora, Ill.)

**CYLINDRICAL GRINDERS.** 24-page catalog J-57 describes Landis 14-in.-18-in. type CH universal prevision cylindrical grinders. Includes specifications. (Write: Landis Tool Company, Dept. RLC, Waynesboro, Pa.)

**STRUCTURAL STEEL.** 20-page booklet describes Super-Strength Structural Steels having minimum yield strengths from 55,000 to 150,000 psi. Reviews 15 different grades of steel produced by seven different companies. Contains technical information and numerous tables describing composition, mechanical properties, heat treatment, corrosion resistance, machinability, size limitations and end uses of these materials. (Write: Climax Molybdenum Company, Metallurgical Development Division, Dept. RLC, 500 Fifth ave., New York 36.)

**ELECTRODE GUIDE.** 70-page Electrode Pocket Guide (ADC 650G) con-

(Continued on page 100)

Take a tip from  
LEADING RAILROADS—  
SPEED UP  
DRILLING  
and  
TAPPING

WITH **ERRINGTON**

Adjustable Multiple  
TAPPING and  
DRILLING HEADS

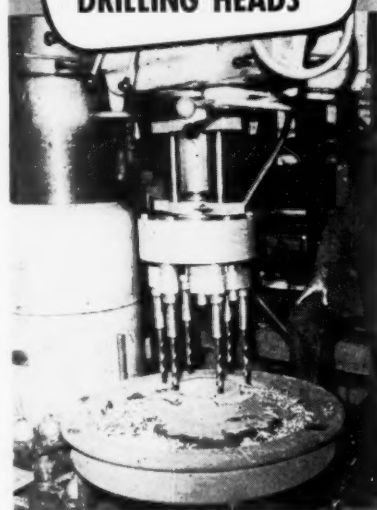


Photo of Diesel Locomotive Shop, Union Pacific R. R., shows Errington Multiple Drill holding six drills—(can also use six tap tools)—drilling passenger car wheel, to make-ready for attaching new style wheel brakes.

Here are versatile tools which permit you to take advantage of a wide range of adjustment—without overhang. Supplied with 3 spindles for equal adjustment in line and 3, 4, 5 or 6 spindles for equal adjustment on bolt circles.

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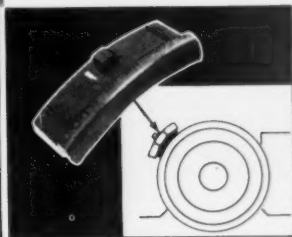
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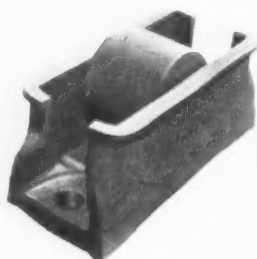
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HIGH CARBON  
ROLLED STEEL

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## Helps From Manufacturers

(Continued from page 98)

tains information essential when buying or using electrodes. Electrode consumption calculator, tabulates data for calculating consumption per linear foot in the welding of various types of joints. Describes each Airco electrode, its color code, application, and best procedure for its use in welding, and explores weld-metal chemical analyses and mechanical properties. Factors which determine electrode selection, industrial and government specifications for filler metals, and testing of deposited weld metal also discussed. (Write: *Air Reduction Sales Company, a division of Air Reduction Company, Dept. RLC, 150 East 42nd st., New York 17.*)

**HYDRAULIC PRESSES.** Bulletin 1015 gives full description and specifications of Elmes hydraulic C-frame presses for forcing, straightening, bending, forming, and similar operations. Describes outstanding features, including extra-rigid main press frame designed to meet NMTBA minimum deflection specifications; press ram of semi-steel fitted at head end with step-seal piston rings; simplified hydraulic circuit utilizing a minimum amount of high-pressure piping; easily removable pumping unit; operation by hand lever or optional foot pedal control. (Write: *Elmes Engineering Division, American Steel Foundries, Dept. RLC, 15 Tennessee ave., Cincinnati 29.*)

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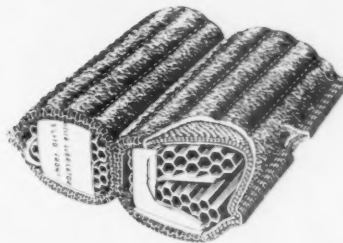
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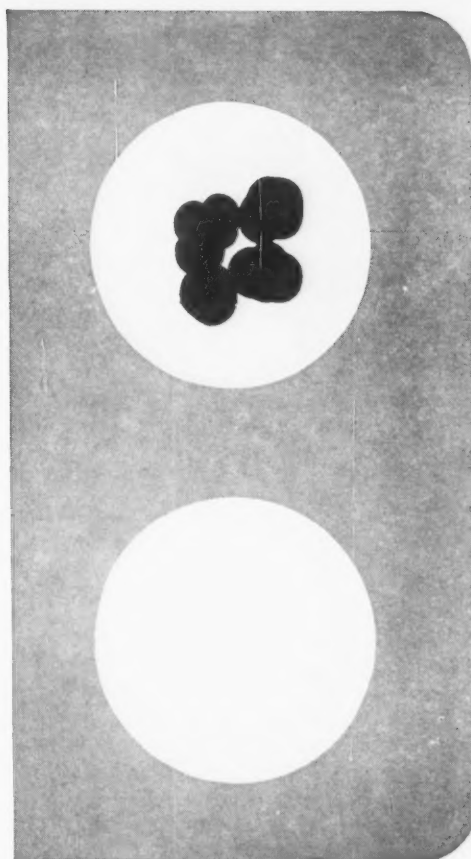
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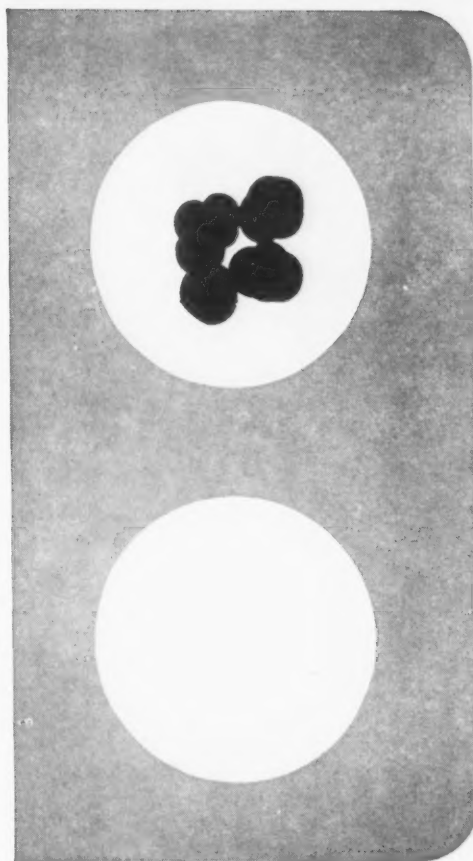
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BRISTOL, CONN.

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advertiser's contract and Railways



*A quick look  
at what 1 pint of  
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Fuel Oil*



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lower-cost fuel oil sample, magnified 8400X, contains sludge particles that foul filters, stick injectors, cut combustion efficiency, and contribute to excessive smoking and sparking.

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